



44. Course Specification of Communication Networks 2

I. Course Identification and General Information:						
1.	Course Title:	Communication Networks 2				
2.	Course Code & Number:	CNE343				
3.	Credit hours:	C.H				Credit Hours
		Th.	Tu.	Pr.	Tr.	
		2	2	2	-	
4.	Study level/ semester at which this course is offered:	Fourth Year/ Second Semester				
5.	Pre –requisite (if any):	Communication Networks 1 (CNE342)				
6.	Co –requisite (if any):	None.				
7.	Program (s) in which the course is offered:	Communication Engineering and Networks				
8.	Language of teaching the course:	English				
9.	Location of teaching the course:	Class room + Lab				
10.	Prepared By:	Associate Prof. Dr. Ali Manea Alsaih				
11.	Date of Approval					

II. Course Description:
<p>This is the second course in communication networks. Topics to be covered include Network-Layer Protocols including IP and ICMP protocols, unicast routing, IPv6, ICMPv6, introduction to transport layer protocols, Internet security (IPsec), and Standard Client-Server Protocols (HTTP, WWW, DNS).</p>

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III. Course Intended learning outcomes (CILOs) of the course		Referenced PILOs
a1	Describe the IP datagram formats, protocols, security mechanisms, transport layer algorithms, and application layers protocols.	A1
a2	Show a good understanding of professional, ethical, legal, security and social issues and responsibilities regarding to the communication networks.	A4
b1	Analyze the local and global impact of computing on individuals, organizations, and society.	B1
b2	Compare the different routing protocols in the network layer and the different algorithms in the transport layer.	B2
c1	Build multiple host network architectures including the operating systems configuration, network specific services, IP address design, routing, switching, and remote access solutions.	C1
c2	Use modern engineering software in the design of communication networks.	C4
d1	Function effectively on teams to accomplish a common goal related to field of communications networks.	D1
d2	Engage in continuing professional development.	D3

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1. Describe the IP datagram formats, protocols, security mechanisms, transport layer algorithms, and application layers protocols.	<ul style="list-style-type: none"> ▪ Lecture ▪ Dialogue and discussion ▪ Problem Solving 	<ul style="list-style-type: none"> ▪ Project ▪ Problem set ▪ Written exam ▪ Written assignment ▪ Lab
a2. Show a good understanding of professional, ethical, legal, security and social issues and responsibilities regarding to the communication networks	<ul style="list-style-type: none"> ▪ Lecture ▪ Dialogue and discussion 	<ul style="list-style-type: none"> ▪ Project ▪ Written exam ▪ Written assignment

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(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1. Analyze the local and global impact of computing on individuals, organizations, and society.	<ul style="list-style-type: none"> ▪ Lecture ▪ Dialogue and discussion ▪ Brainstorming ▪ Problem Solving ▪ Practical application 	<ul style="list-style-type: none"> ▪ Participation ▪ Written assignment ▪ Project
b2. Compare the different routing protocols in the network layer and the different algorithms in the transport layer.	<ul style="list-style-type: none"> ▪ Lecture ▪ Dialogue and discussion ▪ Brainstorming ▪ Problem Solving ▪ Practical application 	<ul style="list-style-type: none"> ▪ Participation ▪ Written assignment ▪ Project

C Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1. Build multiple host network architectures including the operating systems configuration, network specific services, IP address design, routing, switching, and remote access solutions.	<ul style="list-style-type: none"> ▪ Lecture ▪ Practical application ▪ Problem Solving 	<ul style="list-style-type: none"> ▪ Participation ▪ Written assignment ▪ Project
c2. Use modern engineering software in the design of communication networks.	<ul style="list-style-type: none"> ▪ Lab ▪ Dialogue and discussion ▪ Problem Solving ▪ Practical application 	<ul style="list-style-type: none"> ▪ Participation ▪ Written assignment ▪ Project

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(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1. Function effectively on teams to accomplish a common goal related to field of communications networks	<ul style="list-style-type: none"> ▪ Brainstorming ▪ Problem Solving ▪ Practical application 	<ul style="list-style-type: none"> ▪ Participation ▪ Written assignment ▪ Project
d2. Engage in continuing professional development	<ul style="list-style-type: none"> ▪ Lecture ▪ Dialogue and discussion ▪ Brainstorming ▪ Practical application 	<ul style="list-style-type: none"> ▪ Participation ▪ Project

IV. Course Content:					
A – Theoretical Aspect:					
Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	Contact hours
1.	Network layer protocols	a1, a2	<ul style="list-style-type: none"> ▪ IPv4 datagram format ▪ fragmentation in a datagram ▪ ICMP protocol. ▪ Mobile IP 	2	4
2.	Unicast Routing	a1,b2, c1, c2 d1,d2	<ul style="list-style-type: none"> ▪ The concept of unicast routing ▪ The least-cost routing and least-cost trees ▪ The common routing algorithms used in the Internet (The distance-vector, the link-state, the path-vector). ▪ Unicast-routing protocols (RIP, OSPF, and BGP) 	3	6

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3.	Next Generation IP	a1,b1, b2,c1, d2	<ul style="list-style-type: none"> The addressing mechanism in IPv6. IPv6 protocol ICMPv6 The transition mechanisms. 	1	2
4.	Introduction to Transport Layer	a1, a2 b1,b2, d2	<ul style="list-style-type: none"> The idea behind a transport-layer protocol. General transport-layer protocols (simple protocol, Stop and wait, Go-Back N, and Selective Repeat Protocols). 	2	4
5.	Standard Client-Server Protocols	a1, a2 b1,c1, c2, d1,d2	<ul style="list-style-type: none"> The World Wide Web, and the Hyper Text Transfer Protocol. The File Transfer Protocol The electronic mail (E-mail) TELNET Secure Shell Domain Name System (DNS) 	3	6
6.	Internet Security	a1,a2, b1,c1, c2,d1,d2	<ul style="list-style-type: none"> Security at the network layer, IPSec. The security protocols at the transport Security at the application layer Firewalls 	3	6
Number of Weeks /and Units Per Semester				14	28

B – Tutorial Aspects:				
Order	Tasks/ Experiments	Number of Weeks	Contact hours	Learning Outcomes
1.	Network layer protocols including ICMP protocol and Mobile IP	2	4	a1, a2

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2.	Unicast Routing including RIP, OSPF and BGP	3	6	a1,b2, c1, c2 d1,d2
3.	IPv6 protocol, its addressing mechanism and ICMPv6	1	2	a1, b1, b2, c1, d2
4.	Transport layer and its protocols	2	4	a1, a2 b1,b2, d2
5.	Standard Client-Server Protocols	3	6	a1, a2 b1,c1, c2, d1,d2
6.	Internet Security	3	6	a1,a2, b1,c1, c2, d1, d2
Number of Weeks /and Units Per Semester		14	28	

C - Practical Aspect:				
Order	Tasks/ Experiments	Number of Weeks	Contact hours	Learning Outcomes
1.	Static & Default Route	2	4	a2, b2, c1, c2. d1
2.	Summarization	1	2	a2, b1, b2, c1, c2. d1
3.	RIPv2 Routing Protocol	1	2	a2, b1, b2, c1, c2. d1
4.	DHCP	1	2	a2, b1, b2, c1, c2. d1
5.	NAT	1	2	a2, b1, b2, c1, c2. d1
6.	OSPF Routing Protocol	2	4	a2, b1, b2, c1, c2. d1
7.	BGP Routing Protocol	1	2	a2, b1, b2, c1, d1
8.	IPv6	2	4	a2, b1, b2, c1, c2. d1,d2
9.	IP Security	3	6	a1,a2, b1,c1, c2,d1,d2
Number of Weeks /and Units Per Semester		14	28	

V. Teaching strategies of the course:
<ul style="list-style-type: none"> ▪ Lecture ▪ Dialogue and discussion ▪ Brainstorming

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- Problem Solving
- Practical application
- Lab

VI. Reports:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1.	Static routing and default routing	b1, c1,c2,d1, d2	1 st	1
2.	Summarization and RIPv2	b1, c1,c2,d1, d2	4 th	1
3.	DHCP and NAT	b1, c1,c2,d1, d2	6 th	1
4.	Open Shortest Path First (OSPF)	b1, c1,c2,d1, d2	8 th	1
5.	Border Gateway protocol (BGP)	b1, c1,c2,d1, d2	9 th	2
6.	IPv6	b1, c1,c2,d1, d2	11 th	1.5
7.	IP Security (Secure routers from administrative access)	b1, c1,c2,d1, d2	14 th	1.5
Totals				10

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.	Lab reports	Weekly	10	5%	b1, c1,c2,d1, d2
2.	Participation	Weekly	10	5%	a1,a2, b1,b2,c1, c2,d1,d2
3.	Written Midterm Test	7 th	20	10%	a1,a2, b1,b2,c1, c2,d1,d2
4.	Final Design Project	13 th	20	10%	a1,a2, b1,b2,c1, c2,d1,d2
5.	Final Exam (practical)	14 th	20	10%	b1, b2, c1, c2, d1, d2
6.	Final Exam (theoretical)	15 th	120	60%	a1,a2, b1,b2,c1, c2,d1,d2

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Total		200	100%	
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VIII. Learning Resources:	
<ul style="list-style-type: none"> Written in the following order: (Author - Year of publication – Title – Edition – Place of publication – Publisher). 	
1- Required Textbook(s) (maximum two).	
	1- Behrouz A. Forouzan, 2013, Data Communications and Networking – 5th Edition USA - McGraw-Hill.
2- Essential References.	
	1- James F. Kurose and Keith W. Ross, 2013, COMPUTER NETWORKINGA Top-Down Approach - 6th Edition – USA - Addison-Wesley.
3- Electronic Materials and Web Sites etc.	
	1- http://www.mhhe.com/forouzan

IX. Course Policies:	
1.	Class Attendance: A student should attend not less than 75 % of total hours of the subject; otherwise he will not be able to take the exam and will be considered as exam failure. If the student is absent due to illness, he/she should bring an approved statement from university Clinic
2.	Tardy: For late in attending the class, the student will be initially notified. If he repeated lateness in attending class he will be considered as absent.
3.	Exam Attendance/Punctuality: A student should attend the exam on time. He is Permitted to attend an exam half one hour from exam beginning, after that he/she will not be permitted to take the exam and he/she will be considered as absent in exam-
4.	Assignments & Projects: The assignment is given to the students after each chapter; the student has to submit all the assignments for checking on time-
5.	Cheating: For cheating in exam, a student will be considered as failure . In case the cheating is repeated three times during his/her study the student will be disengaged from the Faculty-
6.	Plagiarism:

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	Plagiarism is the attending of a student the exam of a course instead of another student. If the examination committee proved a plagiarism of a student, he will be disengaged from the Faculty. The final disengagement of the student from the Faculty should be confirmed from the Student Council Affair of the university.
7.	<p>Other policies:</p> <ul style="list-style-type: none"> - Mobile phones are not allowed to use during a class lecture. It must be closed, otherwise the student will be asked to leave the lecture room - Mobile phones are not allowed in class during the examination. <p>Lecture notes and assignments my given directly to students using soft or hard copy</p>

Reviewed By	<p><u>Vice Dean for Academic Affairs and Post Graduate Studies: Asst. Prof. Dr. Tarek A. Barakat</u></p> <p><u>President of Quality Assurance Unit: Assoc. Prof. Dr. Mohammed Algorafi</u></p> <p><u>Name of Reviewer from the Department: Asst. Prof. Dr. Nasser H. Almotari</u></p>
	<p><u>Deputy Rector for Academic Affairs Asst. Prof. Dr. Ibrahim AlMutaa</u></p> <p><u>Assoc. Prof. Dr. Ahmed Mujahed</u></p> <p><u>Asst. Prof. Dr. Munasar Alsubri</u></p>

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