Data Communication and Networking (AEE 3610)

اتصالات البيانات والشبكات (هكت 3610)

Course:	Code:	AEE 3610	Instructor:	Name:	Dr. Ali H. Alqahtani
	Credit Hours:	3(2,0,2)		E-mail:	ahqahtani@ksu.edu.sa
	Level:	7		Website:	http://fac.ksu.edu.sa/ahqahtani
	Pre-requisites:	---		Office:	1st floor, F-088
	Co-requisites:	---			
	Section #			Office hour:	See my website

Text Books & References:	1- *Data Communications and Networking, Behrouz A. Forouzan, 4th edition, 2- Communication Networks, Leon-Garcia and Widjaja, McGraw Hill, 2000. 3- Computer Networks, By Andrew S. Tanenbaum, 5th edition, Prentice Hall. 4- CISCO: CCNA ver 6: https://www.netacad.com/login/ 5- https://ccnav6.com/ccna-1-introduction-to-networks-v5-1-v6-0-exams-answers-2017 6- https://cdd.tvtc.gov.sa/sites/default/files/document/_lbynt_wlshbkt.pdf
Course description	This course provides the students with the main concepts of data communication and networking including: Computer networks protocols (ISO-OSI reference model, LAN protocols, Management and Security), Sharing of resources techniques (circuit & packet switching), and Network flow and Design. Note: The materials of the course are based on CISCO CCNA ver 6.
Objectives	The students would acquire the following as outcomes of the course: 1- Basic knowledge in computer networks. 2- Knowledge on the current state of development of computer networks. 3- Analytical tools for basic computer networks design issues. 4- Dealing with practical computer networks design and assessment problems
Outcomes	By completion the course, students will be able to perform the following functions: 1- Explain network technologies. 2- Explain how devices access local and remote network resources. 3- Implement basic network connectivity between devices. 4- Design an IP addressing scheme to provide network connectivity for a network. 5- Describe router hardware. 6- Explain how switching operates in a small to medium-sized business network. 7- Configure monitoring tools available for small to medium-sized business networks. 8- Configure initial settings on a network device.

The topics details are as following:

	Week	Lectures (CISCO: CCNA v6)	Laboratory
Main Topics & Scheduled contact	1	Introduction	Introduction
	2	Chapter 1: Exploring a network 1.1 Globally Connected 1.2 LANs, WANs, and the Internet 1.3 The Network as a Platform 1.4 The Changing Network Environment	• Packet Tracer– Getting started with Packet Tracer • Packet Tracer– Help and Navigation Tips • Packet Tracer – Network Representation
	3	Chapter 2: Network Operating System 2.1 IOS Bootcamp 2.2 Basic Device Configuration 2.3 Address Schemes	• Packet Tracer - Navigating the IOS • Packet Tracer - Configuring Initial Switch Settings • Packet Tracer – Simple Network Example
	4	Chapter 3: Network Protocols and Communications 3.1 Rules of Communication 3.2 Network Protocols and Standards 3.3 Data Transfer in the Network	• Packet Tracer - Pinging and Tracing to Test the Path • Packet Tracer - Testing Connectivity with Traceroute • Packet Tracer - Implementing Basic Connectivity
	5	Chapter 4: Network Access 4.1 Physical Layer Protocols 4.2 Network Media 4.3 Data Link Layer Protocols 4.4 Media Access Control	• Packet Tracer - Investigating the TCP/IP and OSI Models in Action • Packet Tracer - Connecting a Wired and Wireless LAN • Packet Tracer - Identify MAC and IP Addresses
	6	Chapter 5: Ethernet 5.1 Ethernet Protocol	• Packet Tracer - Exploring Internetworking Devices Examples

	5.2 LAN Switches 5.3 Address Resolution Protocol	
7	Chapter 6: Network Layer 6.1 Network Layer Protocols 6.2 Routing	• Packet Tracer - Configure Initial Router Settings • Packet Tracer - Examine the ARP Table • Examples
8	6.3 Routers 6.4 Configure a Cisco Router	• Packet Tracer - Connect a Router to a LAN • Packet Tracer - Troubleshooting Default Gateway Issues • Examples
9	Chapter7: IP Addressing 7.1 IPv4 Network Addresses	• Packet Tracer - Investigate Unicast, Broadcast, and Multicast Traffic • Packet Tracer - Configuring an Integrated Router • Examples
10	**Midterm Exam**	**Midterm Exam**
11	Chapter7: IP Addressing 7.2 IPv6 Network Addresses 7.3 Connectivity Verification	• Packet Tracer - Configuring IPv6 Addressing • Packet Tracer - Verifying IPv4 and IPv6 Addressing • Packet Tracer - Troubleshooting IPv4 and IPv6 Addressing
12	Chapter 8: Subnetting IP Networks 8.1 Subnetting an IPv4 Network 8.2 Addressing Schemes 8.3 Design Considerations for IPv6	• Packet Tracer - Subnetting Scenario • Packet Tracer - Designing and Implementing a VLSM Addressing Scheme • Packet Tracer - Implementing a Subnetted IPv6 Addressing Scheme
13	Chapter 9: Transport layer 9.1 Subnetting an IPv4 Network 9.2 Addressing Schemes	• Packet Tracer - Subnet Scenario 2 • Packet Tracer Simulation - TCP and UDP Communications • Examples
14	Chapter 10: Application Layer 10.1 Application Layer Protocols 10.2 Well-Known Application layer Protocols and Services	• Packet Tracer - Web and Email • Packet Tracer - DHCP and DNS Servers • Packet Tracer - FTP Servers
15	Chapter 11: Build a Small Network 11.1 Network Design 11.2 Network Security	• Packet Tracer – Configuring Secure Passwords and SSH • Packet Tracer Multiuser – Tutorial • Packet Tracer Multiuser - Implement Services
16	**Final Exam**	**Final Exam**

Grading Policy of Activities and Assessment

Assessment task	Date due	Grades	Total
Quizzes (5 – average mark)	During weeks 3, 6, 8, 10, 12	10%	
Homework (3 – average mark)	End of week3, week7, week 11	5%	
Midterm Exam	Within the 6th week	25%	100 %
Laboratory	---	20 %	
Final Exam	As scheduled by the registrar	40 %	

Coursework:

- All coursework activities including assignments and quizzes will be announced in class and online together with deadlines for submission.
- Course materials including lecture notes, presentations, assignments, etc. will be posted regularly on the University Learning Management System (LMS) portal at http://lms.ksu.edu.sa
- Students are required to regularly check their University emails and the online Learning System (LMS) for course announcements and assignments, in addition to the course website: http://fac.ksu.edu.sa/ahqahtani/course/260392
- All assignments should be submitted on time. Late submission will be penalized as follows: 20% off attained mark for every day late. After 5 days from the submission deadline, no assignment will be accepted and a zero mark will be recorded for the particular assignment.
- Copying others' work is plagiarism which is illegal. Plagiarised assignments will not be marked and instead a zero mark will be given to all students involved.
- Marked coursework will be returned to students after one week from the submission deadline.
- Where practical, coursework solutions (of numerical and multiple choice nature) will be posted online one week after the submission deadline.
- Students are required to check their answers against the posted solutions and immediately inform the instructor of any discrepancies they may find in their marked coursework.

Attendance Policy	• Punctual attendance of all classes is crucial for achieving the objectives and learning outcomes of this course. The correlation between attendance and performance is well established. • Attendance is compulsory for all classes including lectures and tutorials. • Any student who arrives after 10 minutes from the start of class will be considered absent. • Any student whose overall attendance in a particular course is below 75% will not be allowed to sit the final exam for that course. • Absence from tutorials will be included in the overall attendance record. • If a student misses a class due to a medical reason, then he must provide a medical certificate from a public hospital within 10 days after his return to University. The certificate must be handed to the course instructor personally. • Non-medical reasons for absence will not be accepted unless approved by the Students' Affairs.
General Rules:	• In addition to the study material posted online and recommended textbook, the students are also required to consult the other suggested references/sources on a regular basis. • Students are required to regularly check their University emails and the online Learning System (LMS) for course announcements and assignments. • Use of mobile phones or other electronic devices is not allowed during class. Unless permitted by the instructor, all such electronic devices must be switched off or put on silence during class. • Students are strongly encouraged to ask questions during lessons when prompted to do so by the instructor. If further clarification is needed, the students could consult the instructor during his assigned office hours. • Where applicable, formulas will be provided in the exams. However, students are required to understand them, recognize their relevance and know how to apply them. • Transparency, honesty and trustworthiness are expected to be upheld by both staff and students at all times. • cell phones should be turned off during class, active participation in this class is a vital part of your success. Mobile phones may be put on silent mode but using it during class is allowed. Mobile phone usage will affect the marks negatively.
Make-up Policy	• There will be no makeup for missed quizzes or unsubmitted assignments. Missed quizzes or unsubmitted assignments will receive zero marks. • Missed quizzes or unsubmitted assignments for eligible reasons will not be considered when calculating the average mark of the related coursework. • Makeup for missed exams will be done according to the University Examination Policy. Any evidence for excused absence must be submitted to the instructor within one week from the date of the missed exam.

*Note: The corresponding chapters covered from the textbook:
Data Communications and Networking, Behrouz A. Forouzan, 4th edition.

Topic	Chapters
Part1: Introduction to networks	Ch 1
Part1: OSI model	Ch 2
Part 2:Physical Layer	Ch 3-Ch 9
Part 3:Data link Layer	Ch 10–Ch 18
Part 4: Network layer	Ch 19-Ch 22
Part 5:Transport layer	Ch 23-Ch 24
Part 6:Application Layer	Ch 25-Ch 29
Part 7: Security	Ch 30-Ch 32