



**Catalog Description:(244)** CSET 221: is an introductory course in Computer Networking. The course provides a comprehensive study of microcomputer networking. Topics include the selection, installation, maintenance, and management of network software and hardware. The Lab will cover the practical implementation of real time Local Area network as well as networking software installation, configuration and Network administration. Prerequisites: CSET 112

**Textbook:** Computer Communication & Network Technologies, Michael A. Gallo, Thomson Learning, 4<sup>th</sup> Edition. (TB)  
**Laboratory manuals:** HBCC, Computer Networks 221 manuals. (LM)  
**Notes:** HBCC, Computer Networks, handouts. (HO)  
**Coordinator:** Dr. Lawan Ahmad Mohammad.  
**Instructor:** Dr. Mubarak Al-Mutairi

**Goals:** the aim of this course is to introduce the students to the concepts of computer networking. The students should get familiar with different networking terminologies and concepts such network software and hardware and the different network layers and the functions that take place in each layer. He should be able to develop and manage Local Area Networks; mainly Ethernet networks. Wide Area Concepts will also be introduced so that the student is familiar with the fast developing technologies needed in the global job market.

**Topics covered:**

1. Introduction to Networking and transmission media (2 classes)
2. Data Communication Theory (2 classes)
3. Type of Networks and their features (2 classes)
4. LAN components (1 class)
5. Network Software(1 class)
6. OSI Ref model, concepts (2 classes)
7. Bridges & Switches (2 classes)
8. VLANs (1 class)
9. Ethernet and Token Ring (2 classes)
10. Network layer, Binary Number system, addressing, devices, Routing (3 classes)
11. Transport layer and functions (3 classes)
12. WAN (3 classes)
13. Major Exams (2 classes)

**Weekly schedule:** attached.

Assessment Policy:	Weighting:	Letter Grading Scale:
Participation	10%	0% < 60% F
Homework	5%	60 % < 65% D
Quizzes	10%	65% < 70% D+
Mid-term lab exam.	5%	70% < 75% C
First Major exam.	15%	75% < 80% C+
Second Major exam.	20%	80% < 85% B
Final examination	30%	85% < 90% B+
Final Lab Exam	<u>5%</u>	90% < 95% A
	100%	95% to 100% A+

**HBCC Rules and Regulations:**

1. **Attendance:** students are expected to attend all meeting of their courses. In the case of any absence, students are responsible for course content during their absence.
2. **Absenteeism:** a record is consistently compiled and updated. If the student has been absent too many times without a valid excuse, he will be excluded from the college.
3. **Smoke free college:** smoking is prohibited in all college facilities.
4. **Behavior:** students who engage in behavior that disrupts the learning environment for others may be subjected to disciplinary action under the KFUPM code.
5. **Exam cheating:** it is not permitted to speak during the exam. Failure to abide by this rule will result in their exam marks being cancelled.
6. **Student IDs:** Students should carry their IDs with them all the time while at the college premises

Prepared by: Dr. Mubarak AlMutairi      Signature: \_\_\_\_\_      Date: \_\_\_\_\_

Approved by: Dr. Hamza Maghrabi      Signature: \_\_\_\_\_      Date: \_\_\_\_\_

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Week no.	Contents	Handout no. & Text Ref.	Practical / support activities	Assessment
1	<p><b>Introduction to Computer Networks,</b> Definitions, network terms, Goals and need of Computer Network, The Internet and its history, use of networks</p> <p>Transmission media and Cabling,</p>	<p>HO # N1 TB: 8-9</p> <p>HO # N2 TB: 12-13 149-153</p>	No Experiment	
2	<p><b>Data Communication Theory.</b> Modulation and Quantization schemes.</p> <p>Sync A sync transmission. Base band &amp; broadband transmission. Circuit switching and Packet switching.</p>	<p>HO # N3</p> <p>HO # N3</p>	<p><b>Experiment 1</b> Introduction to Network Components, Symbols, Physical Layer. Visit/ explanation of the college Network infrastructure.</p>	HW # 1
3	<p><b>Type of Networks and their features.</b> Broadcast and Point to point Networks, LANs and its technologies.</p> <p>WANs, and technologies, Internetwork, Network Models</p>	<p>HO # N4</p> <p>HO # N4</p>	<p><b>Experiment 2</b> Installing NIC, Checking the type of NIC used, Cabling types, Direct and crossover cable preparation and setup.</p>	Quiz # 1
4	<p><b>Network Hardware and devices,</b> Workstations, Servers, advantages of server-based networks.</p> <p>How e-mail is delivered (complete diagram explanation). Network Software (Protocol, Peer, Network architecture, Interfaces and services, connection less and connection-oriented service.</p>	<p>HO # N5 TB: 476</p> <p>HO # N6 TB: 370-380</p>	<p><b>Experiment 3</b> Installing and configuring Windows 2000 Professional.</p>	HW # 2
5	<p><b>OSI reference Model.</b> Use of OSI model. Brief explanation of how the seven layers communicate, data encap and de encap.</p> <p>OSI model (continued), brief explanation of each layer, TCP/IP Ref model, Comparison.</p>	<p>HO # N7 TB: 120-123</p> <p>HO # N8 TB: 457-460</p>	<p><b>Experiment 4</b> Establishing peer-to-peer network and configuration. TCP/IP configuration. Sharing resources. Checking connectivity.</p>	Quiz # 2
6	<p><b>OSI Layer 1 functions,</b> Layer 1 devices: Hubs and Repeaters. <b>Layer 2 Functions and devices,</b> Subdivision of Layer 2</p> <p>Logic Link control features, error detection / correction codes, flow control.</p>	<p>HO # N9 TB: 460-462</p> <p>HO # N10 TB: 460-462</p>	<p><b>Experiment # 5</b> Installing windows 2000 Advanced server, configuration and domain concept. Understanding DNS and DHCP Configuration.</p>	HW # 3

<b>MAJOR-I EXAM</b>				
7	Data Link layer protocol for WAN SLIP, PPP, HDLC.  MAC sub-layer features and MAC addressing. ARP and RARP protocol, Multiple Access (Aloha and CSMA/CD)	HO # N11  HO # N12 TB: 417-419 17, 499	<b>Experiment 6</b> Establishing Active Directory and user management. Establishing Client-server model.	Quiz # 3
8	IEEE standards for LAN and MAN. Ethernet and its features, Ethernet standards,  Token ring and its features. How Token ring works	HO # N13 TB: 124-128  HO # N14 TB: 128-136	<b>Experiment 7</b> Switch configuration and Establishment of VLANS.	HW # 4
9	Layer 2 devices (bridge and switch). Switching, Types of Switching, spanning tree to avoid loops. Concept of VLANS.  Network layer and its functions. Binary numbering scheme	HO # N15 TB: 476-477  HO # N16 TB: 463-464	<b>MIDTERM LAB EXAM</b>	
10	IP addressing.  Subnetting	HO # N17 TB: 311-313  HO # N18 TB: 311-313	<b>Experiment 8</b> Using Network Monitor and filtering the Traffic. IP addressing. Establishing subnets.	Quiz # 4
11	Network layer devices, Concept of routing, Types of Routing Algorithms (Distance vector and Link state)  RIP, IGRP, OSPF, Autonomous system, Exterior gateway and Interior gateway Protocols, Congestion control (Leaky Bucket)	HO # N19 TB: 476  HO # N20	<b>Experiment 9</b> Using Cisco Configmaker to establish a Network.	
<b>MAJOR-II EXAM</b>				
12	<b>Transport Layer and its functions.</b> Concept of sockets and ports, congestion control.  Connection oriented vs. connection less, Reliable vs. unreliable service. TCP and UDP, 3 way-handshake	HO # N21 TB: 20, 505 146-147  HO # N22	<b>Experiment 10</b> Establishing a connection using Dial-up networking. Modem Installation. Internet connection sharing. Proxy server Installation and setup.	HW # 5
13	Continued.  <b>Wide Area Networks.</b> WAN concepts and terminologies	HO # N23  HO # N24 TB: 473-480	<b>Experiment 11</b> Establishing and configuring Terminal service.	Quiz # 5

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14	Frame relay  ISDN	HO # N25 TB: 481-483  HO # N25	<b>Experiment 12</b> Establishing and Configuring IIS.	HW # 6
15	Revision.		<b>LAB FINAL EXAM</b>	Quiz # 6
16			<b>FINAL EXAM</b>	

**NB:**

<b>WEEK #</b>	<b>EXAM ACTIVITY</b>
<b>6</b>	<b>MAJOR-I EXAMS</b>
<b>9</b>	<b>MIDTERM LAB EXAMS</b>
<b>11</b>	<b>MAJOR-II EXAMS</b>
<b>15</b>	<b>LAB FINAL EXAMS</b>
<b>16</b>	<b>FINAL EXAMS</b>