Department of Software and Informatics

College of Engineering

Salahaddin University

Subject: Network Principles

Course Book (Third Year – Fall Semester)

Lecturer's name: Bnar Faisal A. Daham

Academic Year: 2023/2024

Course Book

1. Course name	**Network Principles**
2. Lecturer in charge	**Bnar Faisal A. Daham**
3. Department/ College	**Software and Informatics Engineering Department**
4. Contact	bnar.abdulrahman@su.edu.krd
5. Time (in hours) per week	**Theory two hours** **Practical two hours**
6. Office hours	**Office hours are stated in the time table**
7. Course code	**5149**
8. Teacher's academic profile	**Received the B.Sc. and M.Sc. degrees in Software Engineering, Salahaddin University, Erbil, Iraq, in 2006 and 2009, respectively.**
9. Keywords	**Network Types, Topologies, OSI Model, Layers, TCP/IP Model, IP Addressing.**

10. Course overview:

This course provides an introduction to network principles, understanding how a computer network and how the internet is connected, familiarity with the major components and types of networks, understand the role of network layers, and familiarity with the role of network standards.

11. Course objective:

The students in this course will learn the concepts used to acquire the computer networking knowledge as well as the existing connectivity technologies and the required infrastructure which comprises the key steps involved in the communication process. Identify the key issues for the realization of the LAN/WAN/MAN network architectures and the hybridized existing form in the business environment and enterprise. Establish a solid knowledge of the layered approach that makes design, implementation and operation of extensive networks possible. To learn the 7-layer OSI network model (each layer and its responsibilities) and understand the TCP/IP suite of protocols and the networked applications supported by it.

12. Student's obligation

Students are obliged to attend within the time for lectures, quizzes, and exams.

13. Forms of teaching

As the subject is covered in the class and the lab, so in the theoretical part data show, pen and board are mostly used to make a frequent step by step communication with the audience, whereas in the lab the students deal with their computers and any explanation or clarification

will be done the projectors which is a dynamic tool for such needs.

14. Assessment scheme

50% Quizzes, Homework, Assignments, and daily activities.

50% Final exam

Note:
- There will be randomly quizzes. Each quiz will be given at the beginning of the class.
- There will be class activities during the lecture for this reason student's attendance is required in all classes.

15. Student learning outcome:

At the end of this course, students will be able to:

1. Describe the purpose and function of the networking devices.
2. Identify the importance of network equipment.
3. Identify the importance of the OSI 7-layer reference model & TCP/IP protocol model.

16. Course Reading List and References:

- Any new reference related to computer network and Cisco Networking Academy Program, CCNA, 1,2, 3, and 4 could be useful.

17. Topics

Theory Topics:

Week 1: Introduction to Networking.

Week 2: Network Types (LAN, WAN, MAN, SAN, PAN, etc.)

Week 3 & 4: Network Math, communicating over the Network; data communicating.

Week 5: Network Classifications

Week 6: Topologies (Bus, Star, Ring, etc.)

Week 7: Components and Networking Media Types (UTP, Fiber Optic, etc.)

Week 8: OSI Reference Model

Week 9: TCP/IP Protocol Model

Week 10: IP addressing, Classes A, B, C, and D

Week 11: Public & Private IP addresses

Week 12: Subnetting

Week 13: Revision

Lecturer Name:
Bnar Faisal
(2 hrs. per week)

Week 14: Exam **Practical Topics:** In the practical part Packet Tracer software is used, which is a cross-platform visual simulation tool designed by Cisco Systems that allows you to create network topologies and imitate modern computer networks. The software allows users to simulate the configuration of Cisco routers and switches using a simulated command line interface. Lab 1: Introduction to Cisco Packet Tracer Lab 2: Deploying and Cabling Devices Lab 3: Configure End Devices Lab 4: Create a Simple Network Using Packet Tracer Lab 5: Configure Wireless Security Lab 6: Hub, Switch &Router Lab 7: VLAN Lab 8: SSH &Telnet in switch Lab 9: Revision Lab 10: Exam	

18. Examinations:

Q1. Choose the correct answer:

1. Data communication system within a building or campus is_____

A. LAN
B. WAN
C. MAN
D. PAN

2. The size of IPV4 address is_____

A. 16 bit
B. 32 bit
C. 64 bit

3. _____ provides a connection-oriented reliable service for sending messages

A. TCP
B. IP
C. UDP
D. All of the above

4. The last address of IP address represents_____

A. Unicast address

B. Network address
C. Broadcast address
D. None of above

5. IPv6 doesn't use _____ type of address
A. Broadcast
B. Multicast
C. Anycast

6. MAC Address is used in_____
A. Transport Layer
B. Data Link Layer
C. Application Layer
D. Physical Layer

7. Which of the following protocol is/are defined in Transport layer?
A. FTP
B. TCP
C. UDP
D. B & C

8. Multiple LANs can be connected to form a single MAN.
A. True
B. False

9._____ is the transmission media that can carry huge data to large distances with less delay or latency
A. Coaxial Cables
B. Optical Fiber Cables
C. Twisted Pair Cables

10. _____network topology requires a central controller or hub.
A. Star
B. Mesh
C. Ring
D. Bus

Q2. What is the differences between TCP & UDP.

Q3. What is a protocol? Define it.

Q4. List the network components in detail.

Q5. What are the characteristics for a good network?

19. Extra notes