



**Course:** Computer Networks Lab – 0907528 (1 Cr. – Core Course)

**Catalog Data:** The Computer Networks Lab consists of a Set of Experiments to Give the Student the Practical Experience on Building Basic Local Area Networks (LANs). Introduction to Personal Computers Hardware, Installing Network Interface Cards, Networks Cabling, Local Area Networks and Basic Topologies, Understanding Routers and Routing Principles, Configuring Routers and Routing Protocols, Securing Local Area Networks Using Access Lists, Understanding Switches and Switching Principles, Configuring Switches, Building Virtual Local Area Networks, Trunking Protocols, IP Networks Address Translation and Dynamic Host Control Protocol.

**Prerequisites by Course:** CPE322 Computer Networks

**Prerequisites by Topic:** The student is expected to have a solid background in the principles of computer networks including switching, and routing. Also, knowledge of IP addressing in its different forms such as static, dynamic, and CIDR.

**Textbook:** Lab theory sheets provided by instructors.

**References:**

- Computer Networking, A Top-Down Approach, 4th Ed. James Kurose and Keith Ross, Addison Wesley 2008.
- Cisco website ([www.cisco.com](http://www.cisco.com)) for technical data sheets of devices.

**Course Website:** Documents will be posted via Microsoft Teams

**Schedule Duration:** 6 Weeks, 10 labs, 3 hour each (including exams).

**Minimum Student Material:** Text book, class handouts, some instructor notes, calculator and access to a personal computer and internet.

**Minimum College Facilities:** Lab with whiteboard and projection display facilities, library, and computational facilities. Networking switches, routers, connecting cables, simulation software, high efficiency desktop computers, and network testing equipment.

**Course Objectives:**

1. To allow the students to experience practically the basics of computer networking.
2. Introduce the main equipment used in real world networking environment.
3. Teach the students the basics of troubleshooting computer networks.

**Course Outcomes and Relation to ABET Program Outcomes:** Upon successful completion of this course, a student should be able to:

1. Design and build a small to medium sized computer network including configuring IP addresses and switching or routing protocols. [6]
2. Use network testing devices to locate problems with network cables. [1]
3. Use troubleshooting techniques to locate network faults and fix them. [2]
4. Use network simulation tools to design a small to medium network and simulate its proper operation. [6]
5. Ability to configure and initialize network switches and routers for proper operation. [2, 6]

- Course Topics:**
1. Lab Preparation
  2. Syllabus Distribution & Roadmap Discssion
  3. Network Cabling and Devices and Packet Tracer
  4. IP Addressing – Version 4 – Fixed and Variable Length Subnet Masks (FLSM and VLSM) and Classless Inter-domain Routing (CIDR)
  5. IP Addressing – Version 6 – Types of Addresses and Subnetting
  6. Static Routing & Default Routes
  7. Routing Information Protocol (RIP)
  8. Enhanced Interior Gateway Routing Protocol (EIGRP)
  9. Distance Vector Routing Protocols: Troubleshooting: Link Failures and Recovery
  10. Open Shortest Path First (OSPF) Link State Routing Protocol
  11. Device Configuration (Basic and Routing)
  12. Transport Layer Protocols (TCP and UDP) using Wireshark (if time permits)

**Computer Usage:** Extensive use of desktop computers for network device configuration and simulation.

**Attendance:** Class attendance will be taken every lab and the university’s polices will be enforced in this regard.

**Assessments:** In-Lab Performance, Practical exams, and a Theoretical Exam.

**Grading policy:**

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|-----------------------|-----|
| In-Lab Performance    | 20% |
| Practical Exams (Two) | 40% |
| Final Exam            | 40% |

**Instructor:** Prof. Khalid A. Darabkh, Email: k.darabkeh@ju.edu.jo

**Lab Helpers** Eng. Muna Al-Akhras, Email: m.alakhras@ju.edu.jo

**Class Time and Location:**

Section 1: Monday, 1:00 pm – 4:00 pm

Section 2: Tuesday, 1:30 pm – 4:30 pm

Section 3: Wednesday, 1:00 pm – 4:00 pm

Section 4: Thursday, 1:30 pm – 4:30 pm

**Program Outcomes (PO)**

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|---|--|
| 1 | an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics  |
| 2 | an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors                   |
| 3 | an ability to communicate effectively with a range of audiences  |
| 4 | an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts |
| 5 | an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives   |
| 6 | an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions  |
| 7 | an ability to acquire and apply new knowledge as needed, using appropriate learning strategies   |

**Last Updated:** MARCH 1, 2024