**The University of Jordan**

**Accreditation & Quality Assurance Center**

# COURSE Syllabus

| 1 | Course title | Computer Networks |
|---|---|---|
| 2 | Course number | |
| **3** | Credit hours (theory, practical) | 3 |
| | Contact hours (theory, practical) | 3 |
| 4 | Prerequisites/corequisites | Data Structures |
| 5 | Program title | Computer Science |
| 6 | Program code | |
| 7 | Awarding institution | The University of Jordan |
| 8 | Faculty | Faculty of Information Technology and Systems |
| 9 | Department | Computer Science |
| 10 | Level of course | 3 |
| 11 | Year of study and semester (s) | |
| 12 | Final Qualification | |
| 13 | Other department (s) involved in teaching the course | None |
| 14 | Language of Instruction | English |
| 15 | Date of production/revision | 2019/2020 |
| 16 | Required/ Elective | Required |

**16. Course Coordinator:**

| Name | Office Number | Office Phone | Office Hours | E-mail |
|---|---|---|---|---|
| Dr. Rami S. Alkhawaldeh | | 36066 | | r.alkhawaldeh@ju.edu.jo |

**17.  Other instructors**

*Office numbers, office hours, phone numbers, and email addresses should be listed.*

| Name | Office Number | Office Phone | Office Hours | E-mail |
|---|---|---|---|---|
| | | | | |

**18. Course Description:**

*As stated in the approved study plan.*

This course explores key concepts and essential technologies of computer networks and broad range of topics in networking, including: General overview:  Networks applications, Network classifications and topologies, Network layers, Channel performance measures, transmission media, Communication Network Protocols and architecture; Data link layer: framing, error detection and correction, CSMA/CD, LAN IEEE standards;

Network layer: IP service model, IP Addressing, subnetting, Host configuration DHCP, ARP Protocol, ICMP protocol; Transport layer: UDP protocol, TCP protocol, TCP reliable transfer and sliding window, TCP flow and congestion control; Application layer: DNS protocol, NAT protocol, HTTP protocol, persistent and non-persistent HTTP connection.

## 19. Course aims and outcomes:

A- Aims:

The aim of this course is to introduce the basics of computer networks. Students will learn the fundamentals of networks layered structure, understand common offered layered services, and examine protocols and algorithms used to operate the network.

## 20. Topic Outline and Schedule:

| Topic & References | Week | Achieved ILOs | Evaluation Methods |
|---|---|---|---|
| **Chapter 0: Networks and their Impact:** <br> • Overview: From Technology to Community <br> • Issues in Globalizing Networks <br> • Impact of Computer networking and IoT on Businesses <br> • Applications of Global Networking <br> • Visions for the Future | 1+2 | G | Quiz |
| **Chapter 1 Exploring the Network 1** <br> • Globally Connected (1.1) <br> • LANs, WANs, and the Internet (1.2) <br> • The Network as a Platform (1.3) <br> • The Changing Network Environment (1.4) <br> • Summary (1.5) | 3 | A | Quiz |
| **Chapter 2 Configuring a Network Operating System** <br> • Objectives <br> • Key Terms <br> • Introduction (2.0.1) <br> • IOS Boot Camp (2.1) <br> • Basic Device configuration (2.2) <br> • Address Schemes (2.3) <br> • Summary (2.4) | 4 | C | Lab Assignment |
| **Chapter 3 Network Protocols and Communications** <br> • Introduction (3.0.1.1) <br> • Rules of Communication (3.1) | 5 | A | Quiz |

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|---|---|---|---|
| • Network Protocols and Standards (3.2)<br>• Data in the Network (3.3)<br>• Summary (3.4) | | | |
| **Chapter 4 Network Access**<br><br>• Introduction (4.0)<br>• Physical Layer Protocols (4.1)<br>• Network Media (4.2)<br>• Data Link Layer Protocols (4.3)<br>• Media Access Control (4.4)<br>• Summary (4.5) | 6 | B | Quiz |
| **Chapter 5 Ethernet**<br><br>• Introduction (5.0)<br>• Ethernet Protocol (5.1)<br>• Address Resolution Protocol (5.2, 5.2.1, 5.2.1.1)<br>• LAN Switches (5.3)<br>• Summary (5.4) | 7 | B | Quiz + Lab Assignment |
| **Chapter 6 Network Layer**<br><br>• Introduction (6.0)<br>• Network Layer Protocols (6.1)<br>• Routing (6.2)<br>• Routers (6.3)<br>• Configuring a Cisco Router (6.4)<br>• Summary (6.5) | 8&9 | B+C | Midterm + Lab Assignment |
| **Chapter 7 IP Addressing**<br><br>• Introduction (7.0)<br>• IPv4 Network Addresses (7.1)<br>• IPv6 Network Addresses (7.2)<br>• Connectivity Verification (7.3)<br>• Summary (7.4) | 10 | B+C | Quiz + Lab Assignment |
| **Chapter 9 Subnetting IP Networks**<br><br>• Introduction (8.0)<br>• Subnetting an IPv4 Network (8.1)<br>• Addressing Schemes (8.2)<br>• Design Considerations for IPv6 (8.3)<br>• Summary (8.4) | 11 | B+C | Quiz + Lab Assignment |
| **Chapter 9 Transport Layer**<br><br>• Introduction (9.0)<br>• Transport Layer Protocols (9.1)<br>• TCP and UDP (9.2)<br>• Summary (9.3) | 12&13 | B+C | Quiz + Lab Assignment |
| **Chapter 10 Application Layer**<br><br>• Objectives<br>• Key Terms | 14&15 | B+ C | Quiz + Lab Assignment |

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|---|---|---|---|---|
| • Introduction (10.0)<br>• Application Layer Protocols (10.1)<br>• Well-Known Application Layer Protocols and Services (10.2)<br>• Summary (10.3) | | | | |

## 21. Teaching Methods and Assignments:

Development of ILOs is promoted through the following <u>teaching and learning methods</u>:

| Method | Lecture | Demo | Laboratory | Case study |
|---|---|---|---|---|
| **Learning outcome** | A1 + A2 + A3+ B1 + B3 + D1 + D3 | A3 + B2 + | C1 + C2 | B2 + B3 + D2 |
| **Assessment** | Exams + Assignments | Exams + Assignments | Practical exams + Assignments | Quiz + Presentations |

## 22. Evaluation Methods and Course Requirements:

Opportunities to demonstrate achievement of the ILOs are provided through the following <u>assessment methods and requirements</u>:

| Evaluation Type | Expected Due Date | Weight |
|---|---|---|
| Midterm Exam | | 30% |
| Midterm Practical | | 10% |
| Final Exam | To be announced later | 40% |
| Quizzes + LAB Assignments | | 20% |

## 23. Course Policies:

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| **Cheating** | Cheating or copying on exam or quiz is an illegal and unethical activity.<br>Standard University of Jordan policy will be applied.<br>All graded assignments must be your own work (your own words). |
| **Attendance** | • Excellent attendance is expected.<br>• The University of Jordan policy requires the faculty member to assign ZERO grade (F) if a student misses 10% of the classes that are not excused.<br>• Sign-in sheets will be circulated.<br>• If you miss class, it is your responsibility to find out about any announcements or assignments you may have missed. |
| **Workload** | • Average work-load student should expect to spend 6 hours per week. |
| **Participation** | • Participation in and contribution to class discussions will affect your final grade positively. Raise your hand if you have any question.<br>• Making any kind of disruption and (side talks) in the class will affect you negatively. |

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| **Concerns or Complaints** | • Concerns or complaints should be expressed in the first instance to the lecturer; if no resolution is forthcoming or it is a cross sections issue, then the issue should be brought to the attention of coordinator (for multiple sections) who will take the concerns to the coordination meeting. |
| **University Regulations** | • For more details on University regulations please visit: http://www.ju.edu.jo/rules/index.htm |

## 24. Required equipment:

Cisco switches routers, and various types of cables which are available in the CISCO Academy LAB.

## 25. References:

A- Required book (s), assigned reading and audio-visuals:
CISCO Online and offline material and other software such as packet tracer.

B- Recommended books, materials, and media:

1) L. Peterson and B. Daive, "Computer Networks: A Systems Approach". Latest edition, Morgan Kaufmann.

2) A. Tanenbaum, "Computert Networks", Latest edition, Prentice Hail.
3) Douglas Comer, "Internetworking with TCP/IP Vol. I: Principles, Protocols, and Architecture", Prentice Hall, latest edition.
4) Uyless Black, "TCP/IP and Related Protocol", Latest Edition, McGraw-Hill.

## 26. Additional information:

Semester / Academic Year:     Fall 2019/2020

Course Website:            www.netacad.com

Name of Course Coordinator: Saher Manaseer   Signature: ------------------------- Date: 24/4/2019-----------------

Head of curriculum committee/Department: ------------------------ Signature: --------------------------------

Head of Department: ----------------------- Signature: --------------------------------

Head of curriculum committee/Faculty: ------------------------ Signature: --------------------------------

Dean: ------------------------------------------ -Signature: --------------------------------

Copy to:
Head of Department
Assistant Dean for Quality Assurance
Course File