

**Jerash University**

**Faculty of Computer Science and Information Technology**

**Computer Sciences Department**

**Semester**: Fall Semester 2018/2019

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| **Course symbol and number: 1003250** | **Course Name:** مدخل الى الشبكات وتراسل البيانات |
| **Teaching Language:** English | **Prerequisites:** . **1002110** |
| **Credits:** 3 hours**.** | **Course Level:** 3 |

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| **Course Description** |
| This course aims to introduce the main concepts of computer networks. This includes networks classifications, architectures, applications and standards. This course describes details of the OSI and TCP/IP reference models. In the physical layer, subjects such as the transmission media, wireless transmission, telephone system and mobile telephone system are discussed. The Data Link Layer describes framing, error and flow control, Error detection and correction, elementary data Link protocol and Sliding window protocol. Additionally, within this layer, the Medium Access Sub-layer is described covering channel allocation, multiple access protocols, collision detection protocols, IEEE standard 802 and Ethernet. Concepts of the wireless technology are introduced, covering WLANs protocols, broadband wireless and Bluetooth technology. Afterwards, the Network Layer handles subjects including routing algorithms, congestion control algorithms, QoS issues and Internetworking. The Transport Layer describes transport services, elements of transport protocols and the internet transport protocols: TCP and UDP. At last the Application Layer is described including network security issues, DNS, electronic email, The world wide web and multimedia applications |

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| **Course Objectives** |
| * Introduce students with the networking concepts   Understanding the different sets of network classifications and applications   * Allow the students to distinguish between circuit and packet switching as well as connectionless and connection oriented services. * Introduce the students with OSI reference models and layered protocols. * Allow the students to distinguish between the OSI and TCP/IP reference models. * Introduce the students with the main concepts behind the wireless technology. * Understanding the following main subjects:  1. The Data Link Layer. 2. The Transport Layer. 3. The MAC sub-Layer. 4. The Application Layer. |

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| **Learning Outcomes** |
| Upon completion of this course, the student will be able to:  1. Employ the physical security of network infrastructure components using National Institute of Standards and Technology (NIST) Guidelines and other best practices.  2. Develop backup procedures to provide for data security.  3. Use network operating system features to implement network security.  4. Identify computer and network threats and vulnerabilities and methods to prevent their effects.  5. Use tools to enhance network security.  6. Use encryption techniques to protect network data. |

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|  | **Text Book(s)** |
| **Title** | CCNA Routing and Switching: Introduction to Networks (2015 |
| **Author(s)** | CCNA |
| **Publisher** | 2015 |
| **Year** | 2015 |
| **Edition** | Fourth |

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|  | **References** |
| **Books** | CCNA Routing and Switching: Introduction to Networks (2015 |
| **Internet links** | http://www.jpu.edu.jo/lms |
| **Course link** | [Click here](http://www.jpu.edu.jo/lms) |

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|  | **Instructors** |
| **Instructor** |  |
| **Office Location** | الطابق السادس - 611 |
| **Office Phone** | 666 |
| **E-mail** |  |

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| **Topics Covered** | | | |
| **Topics** | **Chapters in Text** | **Week number** | **Teaching hours** |
| **Introduction**  1.0 Exploring the 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  1.5 Summary | **Chp.1** | 1-3 | 2 |
| **Configuring a Network Operating System** 2.0 Configuring a Network Operating System  2.1 IOS Bootcamp  2.2 Getting Basic  2.3 Address Schemes  2.4 Summary | **Chp. 2** | 4, 5, 6 | 2 |
| **Network Protocols and Communications**  3.0 Network Protocols and Communications  3.1 Rules of Communication  3.2 Network Protocols and Standards  3.3 Moving Data in the Network  3.4 Summary | **Chp.3** | 7 | 2 |
| **Network Access**  4.0 Network Access  4.1 Physical Layer Protocols  4.2 Network Media  4.3 Data Link Layer Protocols  4.4 Media Access Control  4.5 Summary | **Chp.4** | 8 | 3 |
| **Ethernet**  5.0 Ethernet  5.1 Ethernet Protocol  5.2 Address Resolution Protocol  5.3 LAN Switches  5.4 Summary | **Ch.5** | 9 | 3 |
| **Network Layer**  6.0 Network Layer  6.1 Network Layer Protocols  6.2 Routing  6.3 Routers  6.4 Configuring a Cisco Router  6.5 Summary | **Ch.6** | 10 | 4 |
| **Transport Layer**  7.0 Transportation Layer  7.1 Transport Layer Protocols  7.2 TCP and UDP  7.3 Summary | **Ch.7** | 11 | 3 |
| **IP Addressing**  8.0 IP Addressing  8.1 IPv4 Network Addresses  8.2 IPv6 Network Addresses  8.3 Connectivity Verification  8.4 Summary | Ch.8 | 12 | 3 |
| **Subnetting IP Networks**  9.0 Subnetting IP Networks  9.1 Subnetting an IPv4 Network  9.2 Addressing Schemes  9.3 Design Considerations for IPv6  9.4 Summary | Ch.9 | 13 | 3 |
| **Application Layer**  10.0 Application Layer  10.1 Application Layer Protocols  10.2 Well-Known Application Layer Protocols and Services  10.3 The Message Heard Around the World  10.4 Summary | Ch.10 | 14 | 2 |
| **It’s a Network**  11.0 It’s a Network  11.1 Create and Grow  11.2 Keeping the Network Safe  11.3 Basic Network Performance  11.4 Managing IOS Configuration Files  11.5 Integrated Routing Services  11.6 Summary | Ch.11 | 15 | 2 |
|  | Handout |  |  |

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|  | **Evaluation** |  |
| **Assessment Tool** | **Expected Due Date** | **Weight** |
| Programming assignments and LMS |  | 20 % |
| First Exam |  | 20 % |
| Second Exam |  | 20 % |
| Final Exam | According to the University final examination schedule | 40 % |

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|  | **Policy** |
| **Attendance** | Attendance is very important for the course. In accordance with university policy, students missing more than the allowed absence rate of total classes are subject to failure. Penalties may be assessed without regard to the student's performance. Attendance will be recorded at the beginning or end of each class. |
| **Exams** | All exams will be CLOSE-BOOK; necessary algorithms/equations/relations will be supplied as convenient. |

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| **Class Schedule & Room** |

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| **Office Hours** | | |
| Sun: 11 – 12.30  Mon: 11 - 12:30  Tues: 11- 12.30  Wed: 11 – 12:30 | | |
|  | \* Or by an appointment through email |  |

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|  | **Teaching Assistant** |
| To announced later on. |  |

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|  | **Prerequisites** |
| **Prerequisites by course** |  |