



**Philadelphia University**  
**Faculty of Administrative and Financial Sciences**  
**Department of Networking and Systems Management**

**Course Syllabus**

<b>Course title: Computer networks (2)</b>	<b>Course code: (0371326)</b>
<b>Course level: Third year</b>	<b>Course prerequisite (s) and/or requisite (s): (0371224)</b>
<b>Lecture time:</b>	<b>Credit hours: (3) hours.</b>

**Academic Staff Specifics**

<b>Name</b>	<b>Rank</b>	<b>Office Number/ Location And Office Phone Number</b>	<b>Office hours</b>	<b>E-mail address</b>
<b>Sara Shaker Al-Aqra</b>	<b>Lecturer</b>	<b>(32421) / Second Building Ext. :( 2282).</b>		<b>Sphilad888@yahoo.com</b>

**Course Description:**

This course focusing on different topics such as Managing a Cisco Internetwork, IP Routing, Virtual LANs, IPv6, Network Address Translation, Wide Area Networks, and Cisco's Wireless Technologies. This course is complement to the previous prerequisite course Computer networks (1), and can be regarded for preparing the students to pass the special certification exams.

**Course Objectives:**

After completing this course, the student will demonstrate the ability to:

- 1- Configure, verify, and troubleshoot basic router operation and routing on Cisco devices.
- 2- Configure, verify, and troubleshoot a switch with VLANs and inter switch communications.
- 3- Implement, verify, and troubleshoot NAT and ACLs in a medium-size Enterprise branch office network.
- 4- Implement and verify WAN links.
- 5- Implement an IP addressing scheme and IP services to meet network requirements in a medium – size enterprise branch office network.
- 6- Explain and select the appropriate administrative tasks required for a WLAN.

**Course Components:**

- Support material (s).
- Study guide (s).
- Homework and laboratory guide (s) if (applicable).
- **Books (title , author (s), publisher, year of publication)**  
Cisco Certificated Network Associate Study Guide, Seventh Edition, Todd Lammle, Wiley Publishing, 2011.

**Teaching Methods:**

- Lectures.
- Discussion groups.
- Tutorials.
- Debates.
- Homework's.
- Small Project.
- Research Paper
- Hands-in labs.
- Lab Assignment in Labs.

### **Learning Outcomes:**

- **Knowledge and understanding:**

After completing this course successfully, the student will be able to:

- Prepares the students to pass the CCNA 640-802 certification exam.
- Demonstrate knowledge of network architecture, various network, protocols, routers, IPv6, and advanced networking technologies.
- Demonstrate the ability to install, use, configure, verify and troubleshoot routers, VLANs and NAT.

- **Cognitive Skills (thinking and analysis):**

A number of queries are given to the student in the lecture to encourage him make a brain storm. This will definitely help him understand more how to work it out. This is done by offering the idea to students then encourages them to discuss it theoretically. This of course will help them practice in an effective way.

- **Communication Skills (personal and academic):**

- A round is done in the class by the instructor to monitor how the practical part of the course is done to make sure that it is done effectively. Problems that may appear from time to time in the lecture are solved.
- Every lecture there will be five minutes open for discussion. For best discussion, the students are welcome at the lecturer office hours.
- Group Management: Students work on group projects (approximately two to three students) to practice interpersonal skills by communicating with group members, other groups, and peers outside the group.

- **Practical and Subject Specific Skills (Transferable Skills):**

A project is given to the student to use his mental capabilities to solve the problem. This way of demonstrating the course was fruitful taking into account the recognized results achieved. It was not quiet convenient because the short time the students spend in solving the problem.

### **Assessment Instruments**

- Short Reports and/ or Presentations and/ or Short Research Projects.
- Quizzes.
- Homework.
- Final Examination.

<u>Allocation of Marks</u>		
<i>Assessment Instruments</i>	<i>Mark</i>	<i>Exam Date and Day</i>
<i>First Examination</i>	<b>20</b>	<b>19/11/2013 - Tuesday.</b>
<i>Second Examination</i>	<b>20</b>	<b>22/12/2013 - Sunday.</b>
<i>Final Examination</i>	<b>40</b>	<b>19/01/2014 – 28/01/2014</b>
- <i>Project or Research: (5 marks).</i> - <i>Quizzes reports or home works: (5 marks).</i> - <i>Student Projects / researches discussion or presentation: (5 marks).</i> - <i>Student attendance (presence and absence) : (5 marks).</i>	<b>20</b>	
<i>Total</i>	<b>100</b>	

### Documentation and Academic Honesty

- *Documentation style (with illustrative examples).*
- *Protection by copyright*
- *Avoiding plagiarism.*

#### Definition of Plagiarism

*Plagiarism is the unacknowledged borrowing of another writer's words or ideas.*

#### How Can Students Avoid Plagiarism?

*To avoid plagiarism, you must give credit whenever you use*

- *another person's idea, opinion, or theory;*
- *any facts, statistics, graphs, drawings—any pieces of information—that are not common knowledge;*
- *quotations of another person's actual spoken or written words; or*
- *Paraphrase of another person's spoken or written words.*

*If you are in doubt about whether what you are doing is inappropriate, consult your instructor. A claim that "you didn't know it was wrong" will not be accepted as an excuse.*

#### Penalty for Plagiarism

*The minimum penalty for an act of plagiarism is a 0 on the assignment, homework, and project. Serious cases of plagiarism may result in failure in the course as a whole, or expulsion from the university.*

Course/Module Academic Calendar

Week	Basic and support material to be covered	Homework/reports and their due dates
(1)	<p><b><u>Ch(7): Managing a Cisco Internetwork:</u></b></p> <ul style="list-style-type: none"> <li>- The Internal Components of a Cisco Router.</li> <li>-The Router Boot Sequence.</li> <li>-Managing Configuration Register (Understanding the Configuration Register Bits, Checking the Current Configuration Register Value, Changing the Configuration Register, Recovering Passwords).</li> <li>- Boot System Commands.</li> <li>- Backing Up and Restoring the Cisco IOS (Verifying Flash Memory, Backing Up the Cisco IOS, Restoring or Upgrading the Cisco Router IOS).</li> </ul>	<p>-Students drag-and-add period</p>
(2)	<ul style="list-style-type: none"> <li>- Using the Cisco IOS File System (Cisco IFS) to Upgrade an IOS.</li> <li>- Backing Up and Restoring the Cisco Configuration (Backing Up the Cisco Router Configuration (Verifying the Current and stored Configuration, Copying the Current Configuration to NVRAM, Copying the Configuration to a TFTP Server), Restoring the Cisco Router Configuration, Erasing the configuration).</li> <li>- Using the Cisco IOS File System to Manage Your Router's Configuration (Cisco IFS).</li> <li>- Using Cisco Discovery Protocol (CDP): (Getting CDP Timers and Hold time Information, Gathering Neighbor Information, Gathering Interface Traffic Information, Gathering Port and Interface Information, Documenting a Network Topology Using CDP).</li> <li>- Using Telnet (Telnetting into Multiple Devices Simultaneously, Checking Telnet Connections, Checking Telnet Users, Closing Telnet Sessions).</li> <li>- Resolving Hostnames (Building a Host Table, Using DNS to Resolve Names).</li> <li>- Checking Network Connectivity and Troubleshooting (Using the ping Command, traceroute Command, Debugging, and show processes).</li> </ul>	<p>- Eid al-Adha holiday</p>
(3)	<p><b><u>Ch(8): IP Routing:</u></b></p> <ul style="list-style-type: none"> <li>- Routing Basics and the IP Routing Process.</li> <li>- Testing Your IP Routing Understanding.</li> <li>- Configuring IP Routing and Configuring DHCP on Our Router.</li> </ul>	
(4)	<ul style="list-style-type: none"> <li>- Configuring IP Routing in Our Network (Static Routing, Default Routing, Dynamic Routing).</li> <li>- Routing Loops.</li> </ul>	

<b>Week</b>	<b>Basic and support material to be covered</b>	<b>Homework/reports and their due dates</b>
(5)	<ul style="list-style-type: none"> <li>-Routing Information Protocol (RIP) (RIP Timers, Configuration RIP Routing, Verifying the RIP Routing Tables, Holding Down RIP Propagations).</li> <li>-Verifying Configurations Commands (show IP protocols command, debug IP rip command, and troubleshooting).</li> <li>-Enabling RIPv2 on Our Internetwork.</li> <li>- Advertising a Default Route Using RIP.</li> <li>- First exam review.</li> </ul>	- 09/11 - Islamic New Year holiday
(6) <b>First Examination</b>	<ul style="list-style-type: none"> <li>- <b>First exam.</b></li> <li><b><u>Ch(11): Virtual LANs (VLANs):</u></b> <ul style="list-style-type: none"> <li>- VLAN Basics (Broadcast Control, Security, Flexibility and Scalability).</li> <li>- VLAN Memberships (Static VLANs, Dynamic VLANs, Identifying VLANs, Frame Tagging).</li> <li>- VLAN Identification Methods (Inter-Switch Link (ISL), IEEE 802.1Q).</li> <li>- VLAN Trunking Protocol (VTP) (VTP Modes of Operation, VTP Pruning).</li> </ul> </li> </ul>	- <b>First Examination</b>
(7)	<ul style="list-style-type: none"> <li>- Routing between VLANs.</li> <li>- Configuring VLANs.</li> <li>- Assigning Switch Ports to VLANs.</li> <li>- Configuring Trunk Ports.</li> <li>- Configuring Inter-VLAN Routing</li> <li>- Configuring VTP.</li> <li>- Troubleshooting VTP.</li> <li>- Telephony: Configuring Voice VLANs.</li> </ul>	- <b>First Examination</b>
(8)	<ul style="list-style-type: none"> <li><b><u>Ch(13)Network Address Translation (NAT):</u></b> <ul style="list-style-type: none"> <li>- When do we use NAT?</li> <li>- Types of Network Address Translation.</li> <li>- NAT Names.</li> <li>- How NAT Works.</li> <li>- Static NAT configuration.</li> <li>- Dynamic NAT configuration.</li> <li>- PAT (Overloading) configuration.</li> <li>- Testing and Troubleshooting of NAT.</li> </ul> </li> </ul>	
(9)	<ul style="list-style-type: none"> <li><b><u>Ch (16):Wide Area Networks (WAN):</u></b> <ul style="list-style-type: none"> <li>- Introduction to Wide Area Networks (Define WAN Terms, WAN Connection Bandwidth, WAN Connection Types, WAN Support).</li> <li>- Cable and DSL (Cable, DSL,ADSL, LRE).</li> <li>- Cabling the Serial Wide Area Networks (Serial Transmission, DTE &amp; DCE).</li> <li>- High Level Data-Link Control (HDLC) Protocol.</li> <li>- Point to Point Protocol (PPP).</li> <li>- Link Control Protocol (LCP) Configuration Options.</li> <li>- PPP Session Establishment.</li> <li>- PPP Authentication Methods.</li> <li>- Configuring PPP on Cisco Routers.</li> <li>- Configuring PPP Authentication.</li> </ul> </li> </ul>	
(10)	<ul style="list-style-type: none"> <li>- Verifying PPP Encapsulation.</li> <li>- Debugging PPP Authentication.</li> <li>- Mismatched WAN Encapsulations.</li> <li>- Mismatched IP Addresses.</li> <li>- Frame Relay (Introduction to Frame Relay</li> </ul>	

	<ul style="list-style-type: none"> <li>Technology).</li> <li>- Committed Information Rate (CIR).</li> <li>- Frame Relay Encapsulation Types.</li> <li>- Virtual Circuits.</li> <li>- Data Link Connection Identifiers (DLCIs).</li> <li>- Local Management Interface (LMI).</li> <li>- Second exam review.</li> </ul>	
(11) <b>Second Examination</b>	<ul style="list-style-type: none"> <li>- <b>Second exam.</b></li> <li>- Frame Relay Congestion Control.</li> <li>- Troubleshooting Using Frame Relay Congestion Control.</li> <li>- Frame Relay Implementation and Monitoring.</li> <li>- Subinterfaces.</li> <li>- Monitoring Frame Relay.</li> <li>- The show interface Command.</li> <li>- The show interface Command.</li> <li>- The debug frame lmi Command.</li> <li>- Troubleshooting Frame Relay Networks.</li> <li>- Virtual Private Networks.</li> </ul>	- <b>Second Examination</b>
(12)	<ul style="list-style-type: none"> <li>- Introduction to Cisco IOS IPsec.</li> <li>- IPsec Transforms.</li> <li>- Security Protocols ( AH, and ESP).</li> <li>- Encryption.</li> </ul>	- 25/12 - <b>Christmas Holiday</b> - <b>Second Examination</b>
(13)	<p><b><u>Ch(15): Internet Protocol Version 6(IPv6):</u></b></p> <ul style="list-style-type: none"> <li>- The Benefits and Uses of IPv6.</li> <li>- IPv6 Addressing and Expressions.</li> <li>- Shortened Expression.</li> <li>- Address Types.</li> <li>- Special Addresses.</li> <li>- How IPv6 Works in an Internetwork.</li> <li>- Autoconfiguration.</li> <li>- Configuring Cisco Routers with IPv6.</li> <li>- IPv6 Routing Protocols.</li> <li>- Migrating to IPv6.</li> </ul>	-01/01/2014 – <b>New year holiday</b>
(14)	<p><b><u>Ch(14): Cisco’s Wireless Technologies:</u></b></p> <ul style="list-style-type: none"> <li>- Introduction to Wireless Technology.</li> <li>- Basic Wireless Devices.</li> <li>- Wireless Regulations.</li> <li>- Wireless Topologies.</li> </ul>	
(15) <b>Specimen Examination (Optional)</b>	<ul style="list-style-type: none"> <li>- Wireless Security.</li> <li>- Open Access.</li> <li>- Encryption Methods.</li> </ul>	- 14/01 - <b>Prophet's Birthday holiday</b>
(16) <b>Final Examination</b>	<ul style="list-style-type: none"> <li>- Presentation of students' researches.</li> <li>- Discuss student projects.</li> <li>- Comprehensive review for all the topics learned in the whole semester.</li> <li>- <b>Final exam.</b></li> </ul>	- <b>Final Examination</b>

**Expected Workload:**

On average students need to spend 2 hours of study and preparation for each 50-minute lecture/tutorial.

**Attendance Policy:**

Absence from lectures and/or tutorials shall not exceed 15%. Students who exceed the 15% limit without a medical or emergency excuse acceptable to and approved by the Dean of the relevant college/faculty shall not be allowed to take the final examination and shall receive a mark of zero for the course. If the excuse is approved by the Dean, the student shall be considered to have withdrawn from the course.