Introduction

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Course Description

ITCC 1401 Exploration - Network Fundamentals (4)

This is a WECM Course Number.

Prerequisite: Advanced level of understanding of personal computers and operating systems approved by designated Information Technology personnel.

This course introduces the architecture, structure, functions, components, and models of the Internet. It describes the use of OSI and TCP layered models to examine the nature and roles of protocols and services at the applications, network, data link, and physical layers. It covers the principles and structure of IP addressing and the fundamentals of Ethernet concepts, media, and operations. Students build simple LAN topologies by applying basic principles of cabling, perform basic configurations of network devices, including routers and switches, and implement IP addressing schemes.

Licensing/Certification Agency: Cisco Corporation. (3 Lec., 4 Lab.)

Labs use a "model internet" to allow students to analyze real data without affecting production networks. Packet Tracer activities help students to analyze protocol and network operation and build small networks in a simulated environment.

Classes for ITCC-1401-8201 / ITCC-1001-82007 meet on Monday, Wednesday, and Friday from 11:10 a.m. to 3:00 p.m. beginning on Wednesday, January 18, 2012, and continuing through Friday, March 9, 2012. If you are unable to complete this course, you must withdraw by Thursday, February 23, 2012, in order to get a W grade. Failure to withdraw by the withdrawal date could result in a grade of F.

Prerequisites

Suggested prerequisites for this course are ITNW 1321 Introduction to Networking, or ITSC 1470 Introduction to Microcomputer Concepts, or demonstrated competence approved by the instructor.

Learning Outcomes

In this course, students will learn fundamental computer networking terms, concepts, and components. Students will develop skills in basic network configuration, connectivity, and testing using workstations, hubs, routers, and switches. Students will also develop skills in small model LAN and WAN construction, and IP Addressing and subnetting.

Basic competency in English Language Arts is necessary for student success in this course. Written and Oral Communications will be key elements for completion of the course.

Skills and techniques in critical thinking, decision making, and problem solving will be applied.
Learning Objectives

The Network Fundamentals course is an important step toward achieving CCNA certification. Upon completion of the course, students should be able to perform the following tasks:

- Explain the importance of data networks and the Internet in supporting business communications and everyday activities
- Explain how communication works in data networks and the Internet
- Recognize the devices and services that are used to support communications across an Internetwork
- Use network protocol models to explain the layers of communications in data networks
- Explain the role of protocols in data networks
- Describe the importance of addressing and naming schemes at various layers of data networks
- Describe the protocols and services provided by the Application layer in the OSI and TCP/IP models and describe how this layer operates in various networks
- Analyze the operations and features of the Transport layer protocols and services
- Analyze the operations and features of the Network layer protocols and services and explain the fundamental concepts of routing.
- Design, calculate, and apply subnet masks and addresses to fulfill given requirements
- Describe the operation of protocols at the OSI Data link layer and explain how they support communications
- Explain the role of Physical layer protocols and services in supporting communications across data networks
- Explain fundamental Ethernet concepts such as media, services, and operation
- Employ basic cabling and network designs to connect devices in accordance with stated objectives
- Build a simple Ethernet network using routers and switches
- Use Cisco CLI commands to perform basic router and switch configuration and verification
- Analyze the operations and features of common Application layer protocols such as HTTP, DNS, DHCP, SMTP, Telnet, and FTP.
- Utilize common network utilities to verify small network operations and analyze data traffic

Textbooks and Materials

Optional textbooks:

The Companion Guide is a superset of the online curriculum. The Course Booklet is the exact text from the online curriculum but there are no graphics. There are pointers to the online curriculum slides containing the graphics. There is no reason to purchase both the Companion Guide and the Course Booklet.

Materials:
Bound book for use as a Notes/Journal Book; USB memory stick; other ordinary classroom supplies.
Class Attendance and Participation

Class attendance and participation in class discussions are an important part of this course. Students are expected to attend classes regularly and in a timely fashion. As with any course, preparation is essential.

You should read and review the material for the class session prior to the class meeting. This class curriculum is provided on-line at [http://cisco.netacad.net](http://cisco.netacad.net). Students will find it convenient to access the Internet at any time from any location to view the materials. There are a number of Labs to be completed in this class. Students must allocate significant time outside the class room in order to complete the required reading, perform the labs, and accomplish the learning.

Your ability to work with people and contribute to a team is an integral part of the business world. Students in this class will participate in team assignments and in a cooperative learning environment.

Course Content

The instructor reserves the right to amend this syllabus as necessary.

Homework
Homework will be assigned on a regular basis. Due dates and other criteria will be specified when the assignment is made. Late homework assignments will not be accepted.

Packet Tracer
Packet Tracer is very powerful network simulation software that is provided without charge via download from the Cisco Academy website. The link to the download site is on the left side of the initial login screen at [http://cisco.netacad.net](http://cisco.netacad.net). The proficient use of Packet Tracer is fundamental to successfully completing the CCNA curriculum.

On-Line Tests
Upon completion of each chapter in the online curriculum, students will be required to complete a Chapter test.

The Comprehensive Lab final
Students will apply their knowledge of Networks, IP Addressing, and Subnetting to solve a problem in a comprehensive LAB activity.

The Comprehensive Course Final
The Comprehensive Final Exam must be taken on the last day of the course. After completing the exam, students must complete a course survey form online.

Open Lab
Students are required to attend an additional two hours of open lab each week. Room D256 is the designate Open Lab for Computer Networking Students. The hours of availability are posted in Room D105.

A second Lab is available in Room D257, the Main Lab. Students may view the Cisco Curriculum in either of the two labs.
Cooperative Learning
Cooperative Learning is the instructional participation in small groups, allowing students to work together to maximize the quality of their own instruction and that of the other group members. The objective is to produce a higher academic achievement and build more positive relationships among the students than would be possible outside this environment. This will result in valuable preparation for the student in future business world environments.

Evaluation
Students will be evaluated on their performance in the course. Students will be evaluated on their performance in the course. The final grade will be based upon the elements and weights listed here. The accumulated weighted percentages will determine the grade based on the familiar grade scale.

<table>
<thead>
<tr>
<th>Description</th>
<th>Percent</th>
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<tbody>
<tr>
<td>On-line Chapter Exams</td>
<td>25%</td>
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<tr>
<td>12 Chapter Labs</td>
<td>20%</td>
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<tr>
<td>Hands-on Skills Exam</td>
<td>25%</td>
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<tr>
<td>On-line Final Exam</td>
<td>30%</td>
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</table>

Total 100%

The final grade is determined as follows:
A  90 - 100%
B  80 - 89%
C  70 - 79%
D  60 - 69%
F  0 - 59%

Note: A passing grade on the Final Exam and the Skills Exam is required in order to progress to the next Cisco course. All students must complete the Skills Exam.

General Information

Withdrawal Date: Thursday, February 23, 2012

Attendance Policy
In order to be successful, students must attend and participate in enrolled courses. You are expected to attend class regularly and to consult with your instructor whenever an absence is necessary.
Academic Progress
Students are encouraged to discuss academic goals and degree completion with their instructors. Specific advising is available throughout the semester. Check [www.richlandcollege.edu/admissions/process.php](http://www.richlandcollege.edu/admissions/process.php) for more details.

Food and Drinks
No food, drinks, or tobacco will be permitted in the classrooms. Students are expected to maintain proper classroom decorum at all times.

Concurrent CE Class
This is a concurrent class with a Continuing Education (CE) course. If you are a CE student, you have an option to convert your continuing education units into credit. If you choose this option, you must complete all the required course work described in this syllabus. You must have an application on file, along with a declared degree plan, in order to convert your CEU to credit.

If you choose not to complete the entire required course work and later would like to receive credit for this class, at that time you must repeat this class as a credit student.

Institution Policies ([www.richlandcollege.edu/syllabusinfo/syllabiInformation.pdf](http://www.richlandcollege.edu/syllabusinfo/syllabiInformation.pdf))

DCCCD/Richland College Emergency: 972-860-4290

Course Outline
This class will meet each week on the appointed days and times as defined in your class schedules. The class material is provided on-line and is organized into 11 Chapters. This will provide the opportunity to cover about one Chapter at each class meeting, with some minor adjustments as required to cover all the material.

<table>
<thead>
<tr>
<th>Week</th>
<th>Days</th>
<th>Topics</th>
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| 1    | W 01/18, F 01/20 | Introduction to Course and Related Topics. Review the Syllabus. Create Cisco IDs, log on to [http://cisco.netacad.net](http://cisco.netacad.net) and review on-line curriculum. Chapter 1, Living in a Network-Centric World  
- Lab 1.7.1 – Skills Integration Challenge-Introduction to Packet Tracer |
| 2    | M 01/23, W 01/25, F 01/27 | Chapter 6, Address the Network – IPv4  
- Lab 6.7.3 – Hands-on Lab: IPv4 Address Subnetting Part 1  
- Lab 6.7.4 – Hands-on Lab: IPv4 Address Subnetting Part 2  
Chapter 2, Communicating over the Network  
- Lab 2.6.1 – Packet Tracer Exploration: Topology Orientation and Building a Small Network  
- Lab 2.7.1 – Packet Tracer Exploration: Skills Integration Challenge-Examining Packets |
<p>| 3    | M 01/30, W 02/01, F 02/03 | Chapter 3, Application Layer Functionality and Protocols |</p>
<table>
<thead>
<tr>
<th>Week</th>
<th>M</th>
<th>W</th>
<th>F</th>
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<tr>
<td>4</td>
<td>02/06</td>
<td>02/08</td>
<td>02/10</td>
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<td>5</td>
<td>02/13</td>
<td>02/15</td>
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<td>6</td>
<td>02/20</td>
<td>02/22</td>
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<td>7</td>
<td>02/27</td>
<td>02/29</td>
<td>03/02</td>
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<td>8</td>
<td>03/05</td>
<td>03/07</td>
<td>03/09</td>
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<tr>
<th>Chapter 4, OSI Transport Layer</th>
<th>Chapter 5, OSI Network Layer</th>
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<tbody>
<tr>
<td>-</td>
<td>- Lab 5.5.1 – Packet Tracer Exploration: Examining a Device’s Gateway</td>
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<tr>
<td>Chapter 6 Review</td>
<td>Chapter 6 Review</td>
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<td>-</td>
<td>- Lab 6.7.5 – Packet Tracer Exploration: Subnet and Router Configuration</td>
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<td>-</td>
<td>- Lab 6.8.1 – Skills Integration Challenge-Planning Subnets and Configuring IP Addresses</td>
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<tr>
<th>Chapter 7, Data Link Layer</th>
<th>Chapter 8, OSI Physical Layer</th>
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<tr>
<td>-</td>
<td>- Lab 8.3.7 – Packet Tracer Exploration: Simple Wireless LAN Model</td>
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<tr>
<th>Chapter 9, Ethernet</th>
<th>Chapter 10, Planning and Cabling Networks</th>
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<tbody>
<tr>
<td>-</td>
<td>- Lab 9.9.1 – Packet Tracer Exploration: Skills Integration Challenge-Switched Ethernet</td>
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<tr>
<td>Chapter 11, Configuring and Testing Your Network</td>
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<tr>
<td>-</td>
<td>- Lab 11.5.1 – Hands-on Lab: Basic Cisco Device Configuration</td>
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**Friday, March 2nd** – No Class. Faculty Development Day.

Note: This is a tentative schedule. I reserve the right to change the above schedule as needed in order to complete the material on time.
Richland College Scans Statement

What are SCANS skills?

These are the skills that employers need the most from their workers. SCANS (Secretary’s Commission on Achieving Necessary Skills) are the predictors of success in the workplace.

Who defined these skills?

In 1989, the U.S. Department of Labor and Education jointly surveyed U.S. employers to find out the most important skills and competencies needed by workers. The results of that survey identified SCANS.

Richland College Students and SCANS

Richland College is committed to the preparation of our students for success in the workplace.

All Richland College courses provide learning outcomes, which result in the mastery of SCANS skills. Although each course will not include every SCANS skill, each course syllabus will identify the specific SCANS skills and competencies taught in that course. Throughout a formal program of study (Degree or Transfer Program) a student will have the opportunity to master all SCANS skills and competencies.

Skills Underlined below are the specific SCANS for Unix II ITSC 2437.

<table>
<thead>
<tr>
<th>RESOURCES. ALLOCATING.</th>
<th>INTERPERSONAL SKILLS</th>
<th>Information</th>
<th>SYSTEMS</th>
<th>TECHNOLOGY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.a.1 Time</td>
<td>1.b.1. Working on teams</td>
<td>1.c.1. Acquiring &amp; evaluating data</td>
<td>1.d.1. Understanding social, technological, &amp; organizational systems</td>
<td>1.e.1. Selecting equipment &amp; tools</td>
</tr>
<tr>
<td>1.a.3. Materials and facilities</td>
<td>1.b.3. Serving customers</td>
<td>1.c.3. Interpreting &amp; communication systems</td>
<td>1.d.3. Designing and/or improving systems</td>
<td>1.e.2. Maintaining &amp; troubleshooting technologies</td>
</tr>
<tr>
<td>1.a.4. Space</td>
<td>1.b.4. Leading</td>
<td>1.c.4. Processing information with computers</td>
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<td>1.a.5. Staff</td>
<td>1.b.5. Negotiating</td>
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<td></td>
<td>1.b.6. Working with different cultures</td>
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<tr>
<td>SCANS Foundation/Competencies</td>
<td>Courses</td>
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1. SCANS COMPETENCIES
   a. Resources. Allocating:
      (1) Time
      (2) Money
      (3) Materials
      (4) Space
      (5) Staff
   b. Interpersonal Skills:
      (1) Working on teams
      (2) Teaching others
      (3) Serving customers
      (4) Leading
      (5) Negotiating
      (6) Working with different cultures
   c. Information
      (1) Acquiring and evaluating data
      (2) Organizing and maintaining files
      (3) Interpreting and communicating
      (4) Processing information with computers
   d. Systems:
      (1) Understanding social, technological, & organizational systems
      (2) Monitoring & correcting performance
      (3) Designing and/or improving systems
   e. Technology:
      (1) Selecting equipment & tools
      (2) Applying technology to specific tasks
      (3) Maintaining & troubleshooting technologies

2. SCANS FOUNDATIONS
   a. Basic Skills:
      (1) Reading
      (2) Writing
      (3) Arithmetic/Mathematics
      (5) Speaking
      (6) Listening
   b. Thinking Skills:
      (1) Thinking creatively
      (2) Making decisions
      (3) Solving problems
      (4) Seeing with the mind’s eye
      (5) Knowing how to learn and reason
   c. Personal Qualities:
      (1) Individual responsibility
      (2) Self-esteem
      (3) Sociability
      (4) Self-management
      (5) Integrity