SPARTANBURG COMMUNITY COLLEGE

# DATA COMMUNICATIONS

Course Syllabus

Date 11/28/11

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**COURSE NUMBER:** IST 220

**PREREQUISITE(S):** ENG 032, MAT 032, RDG 032

**CO-REQUISITE(S):** None

**COURSE DESCRIPTIONS** This course is a study of the fundamentals of data communications, basic signaling, networking and various transmission media are covered.

**TEXTBOOK(S):** Reid, Allen and Jim Lorenz. Networking for Home and Small Business. Copyright 2008. CCNA Discovery Learning Guide, Cisco Press
ISBN-13: 978-1-58713-209-4. ISBN-10: 1-58713-209-5

**REFERENCE(S):** None

**OTHER REQUIRED MATERIALS, TOOLS, AND EQUIPMENT:** One 3-ring binder and the lab package (May be purchased in SCC Book Inn)

**METHOD OF INSTRUCTION:** Lecture/Class exercises/Lab Assignments

**GRADING SYSTEM:**

| | | | | |
|---|---|---|---|---|
| 90 | - | 100 | = | A |
| 80 | - | 89 | = | B |
| 70 | - | 79 | = | C |
| 60 | - | 69 | = | D |
| Below | - | 60 | = | F |

The standard mathematical procedure of rounding will be applied to arrive at a whole number percentage in final grade calculation.

**GRADE CALCULATION METHOD:**

| | | |
|---|---|---|
| Assessments/Case Projects | = | 30% |
| Lab Activities | = | 20% |
| Packet Tracer Assessments | = | 20% |
| Hands-on Skills Exam | = | 15% |
| Final Exam | = | 15% |
| | = | 100% |

**ATTENDANCE POLICY:**

The student is responsible for punctual and regular attendance in all classes, laboratories, clinical, practica, internships, field trips, and other required class activities. The College does not grant excused absences; therefore, students are urged to reserve their absences for emergencies. When illness or other emergencies occur, the student is responsible for notifying instructors and completing missed work if approved for late submission by instructors.

The student is tardy if not in class at the time the class is scheduled to begin and is admitted to class at the discretion of the instructor.

Instructors maintain attendance records. However, it is the student's responsibility to withdraw from a course. A student enrolling in and attending at least one course session remains enrolled until the student initiates a withdrawal.

Withdrawal Policy: During the first 75% of the course, a student may initiate withdrawal and receive a grade of W. A student cannot initiate a withdrawal during the last 25% of the course. Extenuating circumstances require documentation and approval by the appropriate department head and academic dean.

Absences for Religious Holidays: Students who are absent from class in order to observe religious holidays are responsible for the content of any activities missed and for the completion of assignments occurring during the period of absence. Students who anticipate their observance of religious holidays will cause them to be absent from class and do not wish such absences to penalize their status in class should adhere to the following guidelines:

1. Observance of religious holidays resulting in three or fewer consecutive absences: Discuss the situation with the instructor and provide written notice at least one week prior to the absence(s). Develop (in writing) and instructor-approved plan which outlines the make up of activities and assignments.

2. Observances of religious holidays resulting in four or more consecutive absences: Discuss the situation with the instructor and provide the instructor with written notice within the first 10 days of the academic term. Develop an instructor-approved plan with outlines the make up of activities and assignments.

**CLASSROOM CONDUCT:**

**ACADEMIC DISHONESTY**: Students are expected to uphold the integrity of the College's standard of conduct, specifically in regards to academic honesty. All forms of academic dishonesty including, but not limited to, cheating on assignments/tests, plagiarism, collusion, and falsification of information will call for disciplinary action. Disciplinary action imposed may include one or more of the following: written reprimand, loss of credit for assignment/test, termination from course, and probation, suspension, or expulsion from the College. For further explanation of this and other conduct codes, please refer to the Student Handbook.

**CELLULAR PHONES AND PAGERS/BEEPERS**: Cellular phones, pagers and beepers are not permitted to be turned on or used within the classroom. Use of these devices during classroom time will be considered a violation of the student code as it relates to "disruptive behavior."

**CLASS/LAB PROCEDURES:**

There are two **scheduled** Packet Tracer assessments. Skills exam will be given in class. **There are NO make-up tests given**. Arrangements may be made to take a PT test early **if an urgent appointment** cannot be changed. **Assessments will be available on the Cisco Academy (cisco.netacad.net) website.** The lowest Assessment grade will not be dropped. Lab scores will be based on both attendance and performance. **There are no make-up labs.**

**ASSIGNMENTS:** In addition to any homework assignment given during class, the student must read each chapter of the book prior to its discussion. Following the class, the student should reread the material and complete the Checking Your Understanding questions in the text as a study habit. Four case projects will be assigned throughout the semester. Responses to Case Projects should be at least a 100 word response, showing that some thought has gone into the response. Use additional resources beyond the text to respond to case projects. **Plagiarism will not be tolerated.** It is anticipated that students will spend at least 2-hours per week independently researching information on the Internet and studying the text.

**The Learning Center**, located in the rooms E-2 & E-5 of the East Building, provides computers for your use. Check the website http://www.sccsc.edu/resources/tutoring/tlc or call 592-4968 for current semester operating hours.

**ACCOMMODATIONS:** Students who need special accommodations in this class because of a documented disability should notify Student Disability Services by calling (864) 592-4818, toll-free 1-800-922-3679; via email through the SCC web site at www.sccsc.edu/resources/disabilities; or by visiting the office located in the East Building Room 30-B on the SCC Central campus. Contacting Student Disability Services early in the semester gives the College an opportunity to provide necessary support services and appropriate accommodations.

**Program Department Chair**

Marcia Schenck
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**Inclement Weather Schedule:**
•Check SCC Web Site: www.sccsc.edu
•Tune to **Channel-7** Local T.V. Station (CBS)
•Tune to an FM/AM Local radio station

**COURSE OUTCOMES & OBJECTIVES:** **Upon satisfactory completion of this course, the student will be able to:**

I. Explain the importance of PC hardware
   1. Examine the use of personal computers
   2. Determine the difference between local applications and network applications
   3. Identify some types of computing devices and their main applications
   4. Explain how data is represented and manipulated in a computer system
   5. Explain the role of various computer components and peripherals
   6. Describe the proper way to install and test computer components and peripherals

II. Explain the importance of Operating Systems
   1. Describe the purpose of an OS
   2. Explain what roles the shell and kernel play
   3. Explain the difference between CLI and GUI interface
   4. Define network redirector
   5. Identify some of the common operating systems available

6. Explain the difference between commercial and GPL software licensing
7. Identify the different option for OS installation
8. Describe an OS upgrade and how it is performed
9. Define a file system and the types that are used with PCs
10. Identify what IP parameters must be configured to prepare a computer to participate on the network
11. Describe how operating systems are maintained

III. Explain how devices connect to the network
1. Define the term network and identify the common networks use in everyday life
2. Define communication protocols
3. Describe how communication occurs across a local Ethernet network
4. Identify the main high-level components of an information network
5. Identify when a computer plays the role of client, server, or both on a network
6. Describe how to build a computer peer-to-peer network and verify its functioning
7. Explain how networks are graphically represented and what the differences between logical and physical network topologies are
8. Identify the purpose of the access and distribution layers and what devices each normally contain
9. Explain how hubs, switches, and routers function
10. Define a broadcast domain and a collision domain and why they are important
11. Define ARP and how it functions
12. Explain the importance of a default gateway
13. Define the term prototyping

IV. Describe the process of connecting to the Internet through an ISP
1. Define the term Internet
2. Define Internet service provider (SP) and explain what services it can provide
3. Identify the options for connecting to the Internet using an ISP
4. Describe how the Internet Protocol (IP) is used in sending messages across the Internet
5. Describe how information is sent across the Internet through an ISP
6. Identify the primary components of an ISP Network Operations Center (NOC)

7. Identify the environmental requirements of a home/small business network as compared to those of an ISP NOC
8. Identify different types of cables and connectors used for connecting the devices in a NOC
9. Identify the main Ethernet unshielded twisted-pair (UTP) cable wiring standards
10. Explain the difference between a straight-through and crossover cable and where they are used in an Ethernet local network
11. Describe how UTP are cables constructed and terminated to provide a reliable connection
12. Identify UTP cabling best practices

V. Describe the process of network addressing
   1. Describe the purpose of an IP address and subnet mask and how they are used on the Internet
   2. Explain the difference between a unicast, multicast, and broadcast IP address
   3. Identify the three classes of assignable IP addresses and what their ranges are
   4. Describe how IP addresses are obtained
   5. Explain the difference between a public and a private IP address and when each is used
   6. Define RFC 1918 address space
   7. Describe how NAT functions

VI. Identify network services
   1. Identify the roles of a client and server and how they interact over the network
   2. Identify some common network services available that operate in a client/server relationship
   3. Explain how TCP and UDP transport protocols compare
   4. Describe the function of a port
   5. Identify well-known port numbers and the protocols/applications that use them
   6. Describe what a Domain Name System (DNS) is and its purpose
   7. Explain how various types of Internet applications, such s e-mail, World Wide Web, FTP (File Transfer Protocol), IM (instant messaging), and voice interact
   8. Explain how a protocol stack interacts on a host when sending and receiving a message
   9. Explain the purpose of a layered networking model
   10. Define the Open Systems Interconnect (OSI) layered network model

VII. Wireless Technologies
1. Describe the benefits and limitations of wireless technology
2. Identify where wireless technologies are commonly used
3. Explain how a wireless personal-area network (SPAN) compares to a wireless local-area network (WLAN) and a wireless wide-area network (WWAN) and their functions
4. Identify the components required to build a WLAN and their functions
5. Identify the current standards for WLANs and how they compare
6. Identify what parameters must be configured to allow a wireless client to access network resources
7. Describe the techniques available to help secure the WLAN
8. Explain how an access point and wireless client are configured to allow communication to occur

VIII. Describe basic network security
1. Identify the main networking threats and their characteristics
2. Describe the different methods of attack
3. Identify what security procedures and applications exist to help prevent attacks
4. Define the term firewall and explain how it is used to protect against an attack
5. Explain what a DMZ and how basic DMZ architecture is structured
6. Describe how to configure a DMZ and port forwarding with an integrated router devices
7. Define vulnerability analysis software and how it can help prevent attacks

IX. Troubleshoot your network
1. Describe the steps involved in the troubleshooting process
2. Identify some of the common troubleshooting techniques and when it is appropriate to use each
3. Describe how the senses can be used to troubleshoot network issues
4. Identify the utilities available for troubleshooting connectivity issues
5. Describe some common issues related to wired network

6. Describe some common issues related to WLANs
7. Identify possible sources of help when troubleshooting

X. Apply the concepts
   1. Implement concepts that were studied throughout the textbook to ensure that you have mastered the practical hands-on skills presented in the networking for home and small businesses course of the Cisco curriculum