Tech 65   Dr. Julio R. Garcia
Fall 2012   **Office**: IS 101
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Networking Theory and Applications

Course Description

Introduction to networks and networking concepts. Network architectures. Network media.
Configuring network operating systems. Making networks work. Network topology, standards,
and protocols. Basic network design. Prereq: Tech 60.

Student Learning Objectives

Upon successful completion of this course, you will be able to:

  a. Describe the limitations, advantages, and disadvantages of each major network
     architecture, including Ethernet, token ring, AppleTalk, ARCnet, FDDI, and ATM.
  b. Identify LANs and select appropriate hardware and software for specific networking
     needs.
  c. Manage a computer network.
  d. Design and setup a small network.

Textbooks

Tomsho, G. (2011). Guide to Networking Essentials, (6th Ed). Cambridge, MA: Course
Technology.

LabSim Network Pro. This required software for the lab assignments as well as to reinforce the
lecture material can be purchased online. This software also has videos covering most of the
Tech 65 networking material. The instructions are in the "LabSim Student Worksheet" document
on Desire2Learn (www.sjsu.desire2learn.com) under the "Content" tab.

Evaluation

The final grade for the course will be based on the following items:

Lab Assignments	20%
Class Participation/Case Projects	10%
Small Network Design and Setup	10%
Quizzes (4)	10%
Midterms (2)	15%
Research Paper/Oral Presentation	15%
Final Exam	20%

Notes: You can check your standing in the class by checking on Desire2Learn (*sjsu.desire2learn.com*). Notify the instructor immediately if there is an error in any of your grades. *The last day to correct any discrepancy is the last day of instruction.* There will be no change in your grade after the final grade has been submitted to the university.

Click on the *News* tab on Desire2Learn for updated information regarding this class.

Grading Scale

Course grades will not be curved; it is possible for everyone in the class to get an A (or an F). Your grade depends only on your performance, not on how everyone else in the class does. Thus, there is no reason not to help your classmates in every legal way possible. Course grades will be assigned according to the following scale.

A+	96 - 100%	B+	87 - 89.9%	C+	77 - 79.9%	D+	66 - 69.9%
A	93 - 95.9%	B	83 - 86.9%	C	73 - 76.9%	D	60 - 65.9%
A-	90 - 92.9%	B-	80 - 82.9%	C-	70 - 72.9%	F	0 - 59.9%

Methodology:

To achieve an effective teaching/learning outcome the following methodology will be used:

1. You will study the assigned chapter/material before coming to lecture by reading the textbook and reviewing the PowerPoint presentation posted on Desire2Learn (*sjsu.desire2learn.com).* Click on the Content tab.

2. After reviewing the chapter materials you will answer the Case Projects at the end of the chapter.

3. Be prepared to check your answers of the Case Projects and participate in Group Discussion. This will constitute your *class participation* grade. This group discussion will reinforce and/or enhance your networking knowledge with current and relevant information.

4. Instructor will explain key points and answer questions from students. Instructor may add related material to enrich the course content. Instructor will become more as a facilitator of learning. This means that the instructor will provide as much individual or group assistance as needed.

5. You should work and learn in teams. This is very important to be successful in the real world.

6. You will take four quizzes, two Midterms and the Final Exam. Students will have the opportunity to practice these tests before taking the actual ones. Quizzes, Midterms and the Final Exam will begin and end at the scheduled time.

Lab Assignments

You are expected to complete the lab experiments in the LabSim Network Pro software. It is to your advantage and professional development to complete each lab assignment, do a conscious work and do not procrastinate. It is strongly recommended that you practice these laboratory assignments on a continuous basis rather than all of them at once. You will be evaluated three times during the semester to ensure that you are performing the labs and verify your skills development.

Research Paper

Each student will write a research paper. A sample list of topics is indicated on the last page; however, if you would like to explore a topic of great interest to you then you should obtain the instructor's approval.

The research paper must include a title page, index, introduction, main body, conclusions, and references. The main body should have between 10 to 15 pages, double-spaced. Send your research paper as an attachment in PDF format (preferable) or in WORD and as a single electronic file to *Desire2Learn*. This means that the title page, main body, circuit, references and any appendices must be incorporated in a single document. You *do not* need to submit a hard copy.

You should submit your topic of interest to the instructor by September 19, 2012.

Oral Presentation

Students will explain their findings of the research paper to the class. Each student has a 10-15 minutes time frame to get their points across. It is strongly recommended that you rehearse your presentation and use a professional presentation software package such as PowerPoint.

You *do not* need to submit a copy of your PowerPoint presentation.

Design and Setup of a Small Network

Students working in groups of 2 - 4 will design and setup a small network with 3 or 4 workstations. Each group will provide its own hardware and software and will decide on the best NOS and the appropriate setup. This small network should be able to access files among all workstations, access to a printer and/or access to a scanner. Each student must show his/her mastery of these skills by videotaping all the process including but not limited to parts identification, hardware/software installation, peripherals configuration and configuration setup. This means that while one of the members is performing the process, another member is videotaping him/her. Then take turns. The video tape must be submitted on a CD or a DVD.

University, College, or Department Policy Information

a) Academic integrity statement (from the Office of Student Conduct and Ethical Development):

"Your own commitment to learning, as evidenced by your enrollment at San Jose State University, and the university's Academic Integrity Policy requires you to be honest in all your academic course work. Faculty members are required to report all infractions to the office of Student Conduct and Ethical Development. The policy on academic integrity can be found at http://sa.sjsu.edu/student_conduct.

b) Campus policy in compliance with the Americans with Disabilities Act:

"If you need course adaptations or accommodations because of a disability, or if you need special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible, or see me during office hours. Presidential Directive 97-03 requires that students with disabilities requesting accommodations must register with DRC to establish a record of their disability."

READING ASSIGNMENTS

Tomsho, G. (2011). <u>Guide to Networking Essentials, (6th Ed)</u>. Cambridge, MA: Course Technology.

Date (Approx.)**	Topic
Aug 22nd	• Introduction/Orientation/Greensheets *Prepare for next session:* **Read** Chapter 1: Introduction to Computer Networks Review PPT, Chapter 1 Answer Case Projects, Chapter 1
Aug 29th	• Check answers Case Projects, Chapter 1 • Discussion questions and Case Projects • Select Research Paper Topic due on Sep 19th *Prepare for next session:* **Read** Chapter 2: Network Hardware Essentials Review PPT, Chapter 2 Answer Case Projects, Chapter 2
Sept 5th	• Check answers Case Projects, Chapter 2 • Discussion questions and Case Projects • Select Research Paper Topic due on Sep 19th • **Take** Practice Quiz 1. You can take this test as many times as you wish *Prepare for next session:* **Read** Chapter 3: Network Topology and Technologies Review PPT, Chapter 3 Answer Case Projects, Chapter 3
Sept 12th	• Check answers Case Projects, Chapter 3 • Discussion questions and Case Projects • Select Research Paper Topic due on Sep 19th • **Take** *Quiz 1 – 100% (Chapters 1 & 2). Test not taken by the due date and time will have a grade of 00.* *Prepare for next session:* **Read** Chapter 4: Network Media Review PPT, Chapter 4 Answer Case Projects, Chapter 4

Sept 19th
- Check answers Case Projects, Chapter 4
- Discussion questions and Case Projects
- **Submit** Research Paper Topic
- **Take** Practice Quiz 2. You can take this test as many times as you wish

Prepare for next session:
Read Chapter 5: Networks Protocols
Review PPT, Chapter 5
Answer Case Projects, Chapter 5

Sept 24th
Lab Evaluation 1 (LabSim 0.2.1 to 3.3.3)

Sept 26th
- Check answers Case Projects, Chapter 5
- Discussion questions and Case Projects
- **Start** working on Research Paper Topic and Oral Presentation
- **Take** *Quiz 2 – 100% (Chapters 3 & 4)*. *Test not taken by the due date and time will have a grade of 00.*

Prepare for next session:
Read Chapter 6: Network reference Models and Standards
Review PPT, Chapter 6
Answer Case Projects, Chapter 6

Oct 3rd
- Check answers Case Projects, Chapter 6
- Discussion questions and Case Projects
- Continue working on Research Paper Topic and Oral Presentation

Prepare for next session:
Take Practice **Midterm No. 1**. You can take this test as many times as you wish.

Oct 10th
- **Take** *Midterm No. 1 – 100% (Chapters 1 to 6)*. *Test not taken by the due date and time will have a grade of 00.*
- Continue working on Research Paper Topic and Oral Presentation

Prepare for next session:
Read Chapter 7: Network Hardware in Depth
Review PPT, Chapter 7
Answer Case Projects, Chapter 7

Oct 17th
- Check answers Case Projects, Chapter 7
- Discussion questions and Case Projects
- Continue working on Research Paper Topic and Oral Presentation
- Start Oral Presentations

Prepare for next session:
Read Chapter 8: Network Operating System Fundamentals
Review PPT, Chapter 8
Answer Case Projects, Chapter 8

Oct 22nd   *Lab Evaluation 2 (LabSim 4.2.3 to 6.4.5)*

Oct 24th
- Check answers Case Projects, Chapter 8
- Discussion questions and Case Projects
- Continue working on Research Paper Topic and Oral Presentation
- Continue Oral Presentations
- **Take** Practice Quiz 3. You can take this test as many times as you wish

Prepare for next session:
Read Chapter 9: Server Management and Administration
Review PPT, Chapter 9
Answer Case Projects, Chapter 9

Oct 31st
- Check answers Case Projects, Chapter 9
- Discussion questions and Case Projects
- Continue working on Research Paper Topic and Oral Presentation
- Continue Oral Presentations
- **Take** *Quiz 3 – 100% (Chapters 7 & 8)*. *Test not taken by the due date and time will have a grade of 00.*

Prepare for next session:
Read Chapter 10: Introduction to Network Security
Review PPT, Chapter 10
Answer Case Projects, Chapter 10

Nov 7th
- Check answers Case Projects, Chapter 10
- Discussion questions and Case Projects
- Continue working on Research Paper Topic and Oral Presentation
- Continue Oral Presentations
- **Take** Practice Quiz 4. You can take this test as many times as you wish

Prepare for next session:
Read Chapter 11: Supporting a Small Business Network
Review PPT, Chapter 11
Answer Case Projects, Chapter 11

Nov 14th

- Check answers Case Projects, Chapter 11
- Discussion questions and Case Projects
- Continue working on Research Paper Topic and Oral Presentation
- Continue Oral Presentations
- **Take** *Quiz 4 – 100% (Chapters 9 & 10)*. *Test not taken by the due date and time will have a grade of 00.*

Prepare for next session:
Read Chapter 12: Wide Area Network Essentials
Review PPT, Chapter 12
Answer Case Projects, Chapter 12

Nov 21st

- Check answers Case Projects, Chapter 12
- Discussion questions and Case Projects
- Continue working on Research Paper Topic and Oral Presentation
- Continue Oral Presentations
- **Take** Practice **Midterm No. 2**. You can take this test as many times as you wish

Nov 26th

Lab Evaluation 3 (LabSim 7.2.2 to 10.7.3)
Submit: Small Network (on a CD or a DVD)

Nov 28th

- **Take** *Midterm No. 2 – 100% (Chapters 7 to 12)*. *Test not taken by the due date and time will have a grade of 00.*

Prepare for next session:
Read Chapter 13: Troubleshooting and Support
Review PPT, Chapter 13
Answer Case Projects, Chapter 13

Dec 5th

- Check answers Case Projects, Chapter 12
- Discussion questions and Case Projects
- Continue working on Research Paper Topic and Oral Presentation
- Continue Oral Presentations
- **Take** Practice **Midterm No. 2**. You can take this test as many times as you wish Finish Oral Presentations
- **Submit**: Research Paper (PDF or WORD) to Desire2Learn (Dropbox)

Dec 12th

Final Exam (Wednesday, 1215 – 1430). *Test not taken by the due date and time will have a grade of 00.*

∗∗ Subject to change with fair notice

LabSim – Network Pro Lab Experiments

0.2.1 Using the Simulator

0.2.2 Explore the Lab Interface

0.2.3 Working with Internal Components

0.2.4 Install Expansion Cards

1.4.4 Configure TCP/IP settings

2.1.3 Connect a modem

2.1.4 Connect to an Ethernet network

2.2.3 Connect a cable modem

2.3.3 Connect fiber optic cables 1

2.3.4 Connect fiber optic cables 2

3.1.3 Select and install a network adapter

3.1.4 Connect a media converter

3.2.3 Select a networking device

3.3.3 Select a router

4.2.3 Connect to a 100BaseTX network

4.2.4 Select Ethernet cable

4.2.5 Connect a fiber optic network

4.3.3 Connect network devices

5.1.5 Configure IP addresses

5.2.6 Configure a DHCP client

5.3.4 Configure DNS addresses

5.4.8 Configure routing

5.5.6 Share an Internet connection

6.2.3 Select a Wireless Card

6.2.4 Create a Wireless Network 1

6.2.5 Create a Wireless Network 2

6.4.5 Configure a Wireless Profile

7.2.2 Connect to the PSTN

7.2.3 Connect to a DSL network

7.2.6 Create a dial-up Internet connection

7.3.5 Configure a remote access connection

8.2.5 Configure Windows firewall

8.3.4 Configure a VPN connection

8.4.4 Exploring VLANs

9.3.3 Allow remote desktop connections

10.2.4 Exploring network communications

10.2.5 Troubleshoot network
       communications

10.4.5 Find configuration information

10.4.6 Troubleshoot IP configuration
       problems

10.7.3 Find path information

Suggested Topics for the Research Paper/PowerPoint Presentation

1. Optical Networking
2. Network Security
3. Network protocols
4. Asynchronous Transfer Mode (ATM)
5. Fiber Distributed Data Interface (FDDI)
6. Network Architectures
7. Synchronous Optical Networking (SONET)
8. Switched Multimegabit Data Service (SMDS)
9. Virtual Private Networks
10. Microwave networking technologies
11. Active Directory
12. Domain Name System (DNS)
13. Remote Access Service (RAS)
14. Cloud Technology
15. Smartphone technology
16. Network troubleshooting techniques
17. Other. (Request the instructor's approval first)