FLORIDA STATE UNIVERSITY
COLLEGE OF COMMUNICATION & INFORMATION
School of Information

LIS 5484 INTRODUCTION TO DATA NETWORKS FOR INFORMATION PROFESSIONALS
SECTION(S)
TERM 20XX, COURSE MEETING DAY/TIME, COURSE MEETING LOCATION

MODE OF INSTRUCTION:

Instructor:
Email:
Office:
Phone:
Course Location/Website:
Office Hours (in office, online or via phone):
Teaching Assistant:
Email:

COURSE DESCRIPTION:

A foundation course in networking and telecommunications technologies, and management of modern data networks, with emphasis on the building blocks of local and wide area networks. Subjects covered include networking architectures, topologies, models, layers, protocols, IP sub netting, equipment, operating systems, security and various tools and utilities. Also covered are economic and policy issues inherent to telecommunications, and management skills that the professional in this field will need to master.

COURSE OBJECTIVES:

After successful completion of this course, students will be able to:

1. Analyze and explain the evolution of telecommunications networks, from the telegraph to currently emerging technologies, with a focus on the economic, legal, and policy issues driving the industry
2. Summarize and describe data and voice communications and telecommunications models (e.g., OSI and Internet models), topologies (LAN, MAN and WAN), protocols, standards and architectures in use today.
3. Describe the functions of telecommunications standards bodies, and various standards such as ISO OSI and the IEEE 802-series standards and protocols.
4. Discuss the concepts and the physical "building blocks" of data communication networks such as switches, routers, firewalls, and cabling.
5. Describe logical elements such as algorithms and protocols used to establish communication between networked devices and between multiple networks.
6. Define the characteristics and nomenclature of various wireless protocols and devices.
7. Explain why different technologies are deployed in different contexts of networking, considering factors such as topology, bandwidth, distance, application and number of users.
8. Demonstrate proficiency in IP management including sub-netting and super-netting.
9. Demonstrate the ability to perform basic troubleshooting operations on LANs, WANs and connected devices, and to analyze network traffic and behavior..
10. Describe various information security practices and methods for mitigating network threats.

11. Discuss the use and management implications of telecommunications networks including security, technical staff recruitment and professional development
12. Design a multilayer Ethernet LAN, incorporating and comparing other network topologies as needed.

COURSE MATERIALS:

Required Textbooks:

- CompTIA Network+ Study Guide Authorized Courseware: Exam N10-006, 3rd Edition by Todd Lammle, (2015); ISBN: 978-1-119-02124-7

- Unix and Linux: Visual QuickStart Guide, 4th Edition by Deborah Ray and Eric Ray (2009); ISBN10:0321636783

  In addition to the textbook material, references to additional reading material such as articles, whitepapers, case studies, etc. will be posted on the course site.

COURSE ASSIGNMENTS AND EVALUATION:

Participation Memo: Participation in weekly synchronous and asynchronous sessions is required, as well as in both group projects. This memo details your participation in these activities, and provides an opportunity to comment to the Instructor.

*NIX Hands-On Lab Exercises: Students will complete ten (10) hands-on lab exercises on a Linux server specially-reserved for this course. Students will perform basic system administration tasks, culminating in the construction of 1) a simple web site and 2) a system script

Quizzes: There will be ten (10) required quizzes, all covering telecommunication concepts discussed in class, and described in the textbook. There are also a number of questions covering information theory concepts discussed in class and in supplemental materials found in the online Course Library.

Individual Papers: There are three (3)

1. *Explain a Network Application:* Students will demonstrate understanding of the difference between network(ed) applications, and the protocol stacks with which these network(ed) applications communicate.

2. *Compile Web Resources for Technical Certifications:* Students will demonstrate understanding of various methods of assessing technical competency in various areas of telecommunications. This is intended for persons considering employment as technical personnel, persons supervising technical personnel, persons coordinating with parties providing technical services, or combinations of the above.

3. *Describe a Network Standard:* Students will demonstrate understanding of not only a telecommunication standard, but also the process of researching such a standard. Students will write a briefing to a fictional audience of layperson stakeholders, explaining the substance of the standard, and

summarizing its evolutionary pressures and processes, and how standards and stakeholder groups mutually affect one another.

Group Assignments: There are two (2).

1. ***Analyze a Company:*** Student teams will select a provider of telecommunication services and/or products, and complete an analysis of this provider, including major products and/or services, market share and strategy, financial status, and other elements of the provider. The purpose of this assignment is 1) for students to understand the specific role of various actors in the telecommunication industry, and 2) analyze part of a telecommunication manager's potential supply chain. This paper is written for a fictional audience of layperson stakeholders.

2. ***Design a Network:*** This is a culminating exercise for the course. Students will design a network for a fictional non-profit organization, using knowledge gained in every aspect of this course, and meet the following two goals: 1) design a network that would work properly if constructed, and 2) focus centrally on meeting users' and stakeholders' unique needs, demonstrating students' ability to apply telecommunication concepts and technologies to solve information access problems and provide new opportunities for the client organization.

GRADE CALCULATION:

The cumulative grade consists of the following graded items:

- Participation in Discussions– 10%
- UNIX Exercises– 20%
- Quizzes - 20%
- Individual Papers – 20%
- Group Industry Analysis – 15%
- Group Design Project – 15%

GRADING SCALE:

A	93 – 100	A-	89 – 92		
B+	85 – 88	B	81 – 84	B-	77 – 80
C+	73 – 76	C	69 – 72	C-	65 – 68
D+	61 – 64	D	57 – 60	D-	53 – 56
F	0 – 52				

COURSE SCHEDULE:

WEEK	TOPICS TO BE COVERED
1	Course Overview Basic Network and Telecommunications Concepts Introduction to Information Theory
2	Data Communications and Telecommunications Models: Open Systems Interconnection (OSI) and TCP/IP Models Telephony I; Hartley's Law
3	Basic Networking Devices: Layers 1, 2, and 3 Servers Telephony II; Nyquist Rates, Shannon's Noisy-channel Coding Theorem
4	Layer 2 – Data Link Layer: Ethernet Protocols, Bridging, and Switching Entropy, Redundancy, and Noise
5	Layer 2 – Data Link Layer: Spanning Tree Protocol, Trunking, Aggregation, and Port Mirroring; Switch Management
6	Layer 3 – Network Layer: Routers, Routed Protocols, and Routing Protocols
7	Layer 3 – Network Layer: IP Management Classful and Classless Networks Subnetting and Supernetting IP address management issues for Information Managers
8	Layer 3 – Network Layer: Routing Protocols and Router Management Technical Staff Professional Development
9	Authentication & Access Control: Access Control Lists, VPNJ Tunnels, Cryptography, and Authentication Services Policy and Legal Issue Pertaining to Confidentiality, Integrity, and Access
10	Network Threats and Mitigation – System-Based Security (ACL, etc.) Coordination of Security for Information Managers
11	802.11 Wireless Networking Protocols Scalability Source and Channel Coding
12	Wide Area Network (WAN) Technologies (T12, Metro, etc.) Design Principles
13	Software & Hardware Tools: IDS, IPS, Packet Sniffers, Port Scanners, Etc. Performance Issues: Bandwidth, Latency, Jitter, Packet Drops, Quality of Services (QoS)
14	Management, Monitoring and Optimization
15	Final Projects Presentations

COPYRIGHT STATEMENT:

Some of the materials in this course are possibly copyrighted. They are intended for use only by students registered and enrolled in this course and only for instructional activities associated with, and for the duration of, the course. They may not be retained in another medium or disseminated further. They are provided in compliance with the provisions of the *Technology, Education, And Copyright Harmonization* (TEACH) Act (refer to the 3/7/2001 TEACH Act at www.copyright.gov/legislation/archive/).

SEXUAL HARRASSMENT POLICY:

It is the policy of the University that its employees and students neither commit nor condone sexual harassment in any form. http://registrar.fsu.edu/bulletin/grad/info/university_notices.htm

SCHOOL OF INFORMATION HARDWARE AND SOFTWARE REQUIREMENTS:

A list of all hardware and software requirements for students participating in the School of Information courses can be found at the following location: http://ischool.cci.fsu.edu/academics/online/requirements/

STUDENT ELIGIBILITY FOR AN INCOMPLETE GRADE:

Incomplete ("I") grades will not be assigned, except in the case of exceptional unforeseen circumstances that occur within the last three weeks of the semester and your work has otherwise been satisfactory (C average).

University Attendance Policy:
Excused absences include documented illness, deaths in the family and other documented crises, call to active military duty or jury duty, religious holy days, and official University activities. These absences will be accommodated in a way that does not arbitrarily penalize students who have a valid excuse. Consideration will also be given to students whose dependent children experience serious illness.

Academic Honor Policy:
The Florida State University Academic Honor Policy outlines the University's expectations for the integrity of students' academic work, the procedures for resolving alleged violations of those expectations, and the rights and responsibilities of students and faculty members throughout the process. Students are responsible for reading the Academic Honor Policy and for living up to their pledge to ". . . be honest and truthful and . . . [to] strive for personal and institutional integrity at Florida State University." (Florida State University Academic Honor Policy, found at http://fda.fsu.edu/Academics/Academic-Honor-Policy.)

Americans With Disabilities Act:
Students with disabilities needing academic accommodation should:
(1) register with and provide documentation to the Student Disability Resource Center; and
(2) bring a letter to the instructor indicating the need for accommodation and what type. This should be done during the first week of class.

This syllabus and other class materials are available in alternative format upon request.

For more information about services available to FSU students with disabilities, contact the:

Student Disability Resource Center
874 Traditions Way
108 Student Services Building
Florida State University
Tallahassee, FL 32306-4167
(850) 644-9566 (voice)
(850) 644-8504 (TDD)
sdrc@admin.fsu.edu
http://www.disabilitycenter.fsu.edu/

Free Tutoring from FSU
On-campus tutoring and writing assistance is available for many courses at Florida State University. For more information, visit the Academic Center for Excellence (ACE) Tutoring Services' comprehensive list of on-campus tutoring options - see http://ace.fsu.edu/tutoring or contact tutor@fsu.edu. High-quality tutoring is available by appointment and on a walk-in basis. These services are offered by tutors trained to encourage the highest level of individual academic success while upholding personal academic integrity.

Syllabus Change Policy
"Except for changes that substantially affect implementation of the evaluation (grading) statement, this syllabus is a guide for the course and is subject to change with advance notice."