

Course Syllabus

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Please note that the specifics of this Course Syllabus are subject to change. Instructors will notify students of any changes and students will be responsible for abiding by them. Even if you print this syllabus, please check the online version often.

Description

IST 220: Networking and Telecommunications (3 credits) - Introduction to digital network topologies; transmission media, signal modulation, digital packet switching and routing, systems integration, communications management, and security.

IST 220 will provide students with a foundational knowledge of the telecommunications and networking industry, as well as the basic concepts inherent to the application of data communications and computer networks in a digital age. This course focuses on the design and development of data communication networks using problems and labs to facilitate student learning. The content provides an introduction to and history of data communications, an overview of different types of networks and network layers, and the future of the industry with a focus on the relationship to e-business and the digital global economy.

Prerequisites

- IST 110

Time / Location

T/Th 4:30 - 5:45 PM
205 IST Building

Goals

- Provide the foundational knowledge of the telecommunications and networking industry.
- Present the basic concepts inherent to the application of data communications and computer networks in the digital age.

Objectives

Upon completion of this course, students will be able to:

- Introduce the role and application of data communication networks hardware and software.
- Describe the network architectures, components, and other key terms associated with the physical layer.
- Discuss the foundational concepts associated with data transmission.
- Discuss networking terms and characteristics, motivations for networking, and the major network applications.
- Implement multiple network designs.
- Discuss LAN and WAN Hardware and Software alternatives and selection.
- Describe LAN and WAN topologies, protocols, and transmission services.
- Discuss WAN implementations and international and global networks.
- Describe network interconnections, shared media technologies, and interconnection utilities.
- Define network management issues, the operations of a network management system, and management tools.
- Discuss the issues related to network security, error detection, backup systems, and recovery plans.
- Identify future trends in data communications and networking.

Instructor

- Marc Rigas, PhD
Adjunct Faculty, IST
Associate Director, Strategic Interdisciplinary Research Office
(814) 863-0050
[rigasm@psu.edu \(mailto:rigasm@psu.edu\)](mailto:rigasm@psu.edu)

INSTRUCTOR OFFICE HOURS:
302 IST - Tuesdays 3:15 - 4:15

Fridays 1:00 - 2:00

103 Beecher Dock House - by appointment

Undergraduate Learning Assistant

Seul Ji (Jennifer) Choi

sqc5668@psu.edu

Materials

- Kurose, J. & Ross, K. (2016). Computer Networking: A Top-Down Approach (7th ed.). Pearson. ISBN 978-0133594140

Assignments & Grading

Course Grading Breakdown

Grading Category	Percentage of Final Grade
Exams (2 @ 15%)	30%
Labs	20%
Project	20%
Quizzes	10%
Homeworks	10%
Attendance & Participation	10%
TOTAL	100%

Course Grading Scale

The following are minimum cutoffs for each grade:

A	93% - 100%
A-	90% - 92.4%
B+	87% - 89.4%
B	83% - 86.4%
B-	80% - 82.4%
C+	77% - 79.4%
C	73% - 76.4%
C-	70% - 72.4%
D	60% - 69.4%
F	less than 60%

Course Policies and Expectations

Logging into Canvas

Students are expected to login regularly to check for course updates, announcements, emails, discussions, etc.

Attendance

Attendance will be taken each class period. You will need to sign in each day of the class. Attendance will be counted for 3 points for each of the class sessions to a maximum of 90 points. 10 points extra will be given for class participation (participating in discussions, class activities, etc.)

Excused absences for official university travel (sports teams, clubs, etc.), religious observance and for out-of-town interviews for internships or jobs **can be REQUESTED one week prior to the class period** by emailing Professor Rigas in Canvas. Excused absences will not reduce your attendance points. For cases of illness, injury or family emergency, excused absences are requested the same way, prior to the end of the day of the class in question. Only two excused absence will be granted for a family emergency or illness for the semester. Additional absences will be unexcused.

Academic Integrity

The College of IST is committed to maintaining academic integrity in this and all other courses it offers. IST takes academic integrity matters seriously. Academic integrity - scholarship free of fraud and deception - is an important educational objective of Penn State. Academic dishonesty can lead to a failing grade or referral to the [Office of Judicial Affairs \(Links to an external site.\)](http://www.sa.psu.edu/ja/) (<http://www.sa.psu.edu/ja/>). Academic dishonesty includes, but is not limited to:

- Cheating
- Plagiarism
- Fabrication of information or citations
- Facilitating acts of academic dishonesty by others
- Unauthorized prior possession of examinations
- Submitting the work of another person or work previously used without informing the instructor and securing written approval
- Tampering with the academic work of other students

In cases where academic integrity is questioned, [Penn State's policy on academic integrity \(Links to an external site.\)](http://www.psu.edu/ufs/policies/47-00.html#49-20) (<http://www.psu.edu/ufs/policies/47-00.html#49-20>) requires that the instructor give the student notice of the charge as well as the recommended sanction. Procedures allow the student to accept or contest the charge through discussions with the instructor. If a student chooses to contest, the case will then be managed by the respective College or Campus Academic Integrity Committee. If a disciplinary sanction also is recommended, the case will be referred to the [Office of Judicial Affairs \(Links to an external site.\)](http://www.sa.psu.edu/ja/) (<http://www.sa.psu.edu/ja/>).

All Penn State colleges abide by this Penn State policy, but review procedures vary by college when academic dishonesty is suspected. Information about Penn State's academic integrity policy and college review procedures is included in the information students receive upon enrolling in a course.

Additionally, students enrolled at Penn State are expected to act with civility and personal integrity; respect other students' dignity, rights, and property; and help create and maintain an environment in which all can succeed through the fruits of their own efforts. An environment of academic integrity is requisite to respect for self and others, and a civil community.

For more information on academic integrity at Penn State, please visit one of the following URLs:

- [http://www.psu.edu/dept/oue/aappm/G-9.html \(Links to an external site.\)](http://www.psu.edu/dept/oue/aappm/G-9.html) (<http://www.psu.edu/dept/oue/aappm/G-9.html>)
- [http://www.sa.psu.edu/ja/ \(Links to an external site.\)](http://www.sa.psu.edu/ja/) (<http://www.sa.psu.edu/ja/>)

Any violation of academic integrity will be investigated, and where warranted, punitive action will be taken. For **every** incident when a penalty of any kind is assessed, a report must be filed.

Technical Requirements

You will be required to utilize a number of technical systems to accomplish your goals in this course. All required hardware and software will be made available to you on the computers in the classrooms in the IST Building. It may be possible for you to also accomplish some of these tasks remotely and from your own computer. However, it is not the responsibility of the instructor or learning assistant to troubleshoot your computer, your home network or your software problems. If you have difficulty that you are not able to resolve, please use the systems provided for you in the classroom.

Resources

Find extensive information and links to many resources, including the Penn State library, web conferencing, course tools, writing help, and much more on the [Resources](https://docs.google.com/document/d/1Zsu5Lgaic3kLLiM3co5mxWU5B7IOfu15sppAQvsym6E/pub) (<https://docs.google.com/document/d/1Zsu5Lgaic3kLLiM3co5mxWU5B7IOfu15sppAQvsym6E/pub>) page.

University Policies


Review current information regarding Penn State policies, including Academic Integrity, Disability Accommodations, Military Accommodations, and many others on the [University Policies](https://docs.google.com/document/d/1FIQdIl2qw3SJOlgQWTWRByCxSbsnY6DcZA0JHzL4yBk/pub) [_https://docs.google.com/document/d/1FIQdIl2qw3SJOlgQWTWRByCxSbsnY6DcZA0JHzL4yBk/pub](https://docs.google.com/document/d/1FIQdIl2qw3SJOlgQWTWRByCxSbsnY6DcZA0JHzL4yBk/pub) page.

Schedule






The following schedule outlines the topics covered in this course, along with the associated time frames, readings, activities, and assignments:

DATE	Chapter / Topic/Class activity
Tue, Jan 10	Syllabus, Intro, Chapter 1.1 - 1.2
Thu, Jan 12	Chapter 1.3 - 1.4
Tue, Jan 17	Chapter 1.5 - 1.7 (Layers & Security), Tech intro
Thu, Jan 19	Chapter 2 - Application Layer
Tue, Jan 24	Chapter 2 (cont.)
Thu, Jan 26	In Class Lab work
Tue, Jan 31	Chapter 3 - Transport Layer
Thu, Feb 2	Chapter 3 - cont.
Tue, Feb 7	In class Lab Work
Thu, Feb 9	Chapter 4 - The Network Layer: Data Plane
Tue, Feb 14	Chapter 4 (cont.) / In Class Lab Work
Thu, Feb 16	Chapter 5 - The Network Layer: Control Plane
Tue, Feb 21	Chapter 5 (cont.)
Thu, Feb 23	Intro Group Project / Exam Review
Tue, Feb 28	Exam 1
Thu, Mar 2	In Class Lab work / group project intro
Tue, Mar 14	Chapter 6 - The Link Layer and LANs
Thu, Mar 16	Chapter 6 (cont.)
Tue, Mar 21	Chapter 7 - Wireless and Mobile Networks
Thu, Mar 23	Chapter 7 (cont.)
Tue, Mar 28	Chapter 8 - Security in Computer Networks
Thu, Mar 30	In Class Lab Work
Tue, Apr 4	Chapter 8 (cont.)
Thu, Apr 6	Chapter 9 - Multimedia Networking
Tue, Apr 11	Chapter 9 (cont.) / In Class Lab Work
Thu, Apr 13	Exam review / project work
Tue, Apr 18	Exam 2
Thu, Apr 20	Hold for possible tour or goes speaker
Tue, Apr 25	Group Project: Presentations
Thu, Apr 27	Group Project: Presentations

Assignments Summary:

Date	Details	
Tue Jan 17, 2017	 L00: Using Canvas Quiz _https://psu.instructure.com/courses/1819419/assignments/8981572	due by 11:59pm

Date	Details	
Thu Jan 19, 2017	❏ Chapter 1 Quiz - Computer Networks and the Internet (Makeup V) https://psu.instructure.com/courses/1819419/assignments/9080987	due by 5:15pm
Sun Jan 22, 2017	❏ Homework 1 - Diagram Your Home Network https://psu.instructure.com/courses/1819419/assignments/8982078	due by 11:59pm
Sun Jan 29, 2017	❏ Lab 1 - Introduction to CloudShark https://psu.instructure.com/courses/1819419/assignments/8982094	due by 11:59pm
Tue Jan 31, 2017	❏ Chapter 2 Quiz - Application Layer https://psu.instructure.com/courses/1819419/assignments/8981575	due by 5:15pm
Thu Feb 9, 2017	❏ Chapter 3 Quiz - Transport Layer https://psu.instructure.com/courses/1819419/assignments/8981578	due by 5:15pm
Sun Feb 12, 2017	❏ Lab 2 - TCP Analysis with CloudShark https://psu.instructure.com/courses/1819419/assignments/8982095	due by 11:59pm
Sun Feb 19, 2017	❏ Homework 3 - Network Diagram for ABC Corporation https://psu.instructure.com/courses/1819419/assignments/8982079	due by 11:59pm
Thu Feb 23, 2017	❏ Chapters 4 and 5 Quiz - Network Layer https://psu.instructure.com/courses/1819419/assignments/8981567	due by 5:15pm
Sun Feb 26, 2017	❏ Group Contract and MOU https://psu.instructure.com/courses/1819419/assignments/8982075	due by 11:59pm
Tue Feb 28, 2017	❏ Exam 1 (https://psu.instructure.com/courses/1819419/assignments/8981576)	due by 5:50pm
Fri Mar 3, 2017	❏ Lab 3 - Cloudshark ARP and Ethernet https://psu.instructure.com/courses/1819419/assignments/8982096	due by 11:59pm
Tue Mar 21, 2017	❏ Chapter 6 Quiz - The Link Layer and LANS https://psu.instructure.com/courses/1819419/assignments/8981571	due by 5pm
Tue Mar 28, 2017	❏ Chapter 7 Quiz - Wireless and Mobile Networks https://psu.instructure.com/courses/1819419/assignments/8981570	due by 5pm
Sun Apr 2, 2017	❏ Lab 4 - DNS in Cloudshark https://psu.instructure.com/courses/1819419/assignments/8982097	due by 11:59pm
Thu Apr 6, 2017	❏ Chapter 8 Quiz - Security in Computer Networks https://psu.instructure.com/courses/1819419/assignments/8981573	due by 5pm
Sun Apr 9, 2017	❏ Group Project: Problem Part 1 https://psu.instructure.com/courses/1819419/assignments/8982076	due by 11:59pm
	❏ INSTRUCTOR TO UPDATE: Peer Evaluation 1 https://psu.instructure.com/courses/1819419/assignments/8982082	due by 11:59pm

Date	Details	
Thu Apr 13, 2017	 Chapter 9 Quiz - Multimedia Networking (https://psu.instructure.com/courses/1819419/assignments/8981569)	due by 5pm
Sun Apr 16, 2017	 Lab 5 - DHCP in Cloudshark (https://psu.instructure.com/courses/1819419/assignments/8982098)	due by 11:59pm
Tue Apr 18, 2017	 Exam 2 (https://psu.instructure.com/courses/1819419/assignments/8981574)	due by 5:50pm
Sun Apr 23, 2017	 Group Project: Problem Part 2 (https://psu.instructure.com/courses/1819419/assignments/8982077)	due by 11:59pm
Fri Apr 28, 2017	 INSTRUCTOR TO UPDATE: Peer Evaluation 2 (https://psu.instructure.com/courses/1819419/assignments/8982083)	due by 11:59pm