

Summer 2020

CS 656-850: Internet and Higher-Layer Protocols

Grace Guiling Wang

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Syllabus

Course Information

Course Number: CS656

Course Title: Internet and Higher-Layer Protocols

Faculty Contact Information

Instructor: Dr. Grace Guiling Wang

Email: gwang@njit.edu

TA: Junyi Ye

Email: jy394@njit.edu

Office Hours: Office hours will be held through WebEx on Monday 9-10am, Wednesday 7-8pm, and Friday 4-5pm. The link will be posted in the “Instructor Announcement” discussion forum.

Course Description

This course studies the architecture and protocols of modern computer networks. Topics to be covered include: addressing, performance measurement metrics, application-layer protocols, transport-layer protocols, networking-layer protocols, link-layer protocols, and wireless and mobile networking. Upon successful completion of the course, students will have gained a deep understanding of the fundamental concepts and principles of designing and implementing modern computer networks.

Textbook and Materials

Kurose, J. & Ross, K. *Computer Networking: A Top-Down Approach*. Pearson, 7th edition, 2016, ISBN: 978-0133594140 (You can also use the 6th edition; ISBN: 978-0132856201)

Prerequisite

Decent programming skills are required. **The class has a semester-long programming project and the professor will not debug this assignment for you.** CS356 or equivalent courses are suggested.

Course Outcomes

- Deep understanding of modern computer network architecture and protocols.
 - Broad knowledge on start-of-the-art network concepts.
 - Hands-on experience in designing and coding network-related mobile application.
 - Improved presentation skills.
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Grading Scale

Grade	Percentile	Percentage
A	4.0	< = 25%
B+	3.5	< = 25%
B	3.0	< = 25%
C+	2.5	< = 15%
C	2.0	< = 10%
F	N/A	~

Reminder: At the discretion of the instructor, the grading may be done on a curve.

Grading Categories

Categories	Percentage
Quiz	8%
Research / Presentation Assignment	20%
Programming Assignment	20%
Mid-Term Exam	20%
Final Exam	32%

The overall score must be higher than 60 to pass the class.

Quiz Dates

Quiz	Date
Module 03: Quiz 01	June 2 - 3
Module 05: Quiz 02	June 14 -15
Module 10: Quiz 03	July 10 - 11
Module 13: Quiz 04	July 25 - 26

Time Commitment

Date	Topic
Module 1	
May 18 - May 23	Introduction / Protocol Layer and Service Models
Module 2	
May 24 - May 29	Network Performance: Delay and Loss/ Addresses
Module 3	
May 30 - June 3	Application Layer Architecture/ FTP and E-mail/P2P Applications
Module 4	
June 4 - June 9	The Web, HTTP, and DNS
Module 5	
June 10 - June 15	Web Searching/ Intro to Transport Layer/ UDP
Module 6	
June 16 - June 20	Principles of Reliable Data Transfer/ TCP Reliability
Module 7	
June 21 - June 25	TCP Congestion Control
Midterm Exam	
Module 8	
June 26 - July 1	Router/ IP
Module 9	
July 2 - July 6	Routing Algorithms
Module 10	
July 7 - July 11	Introduction to Link Layer/ MAC Protocol
Module 11	
July 12 - July 16	Switched Local Network/ Overview of the Five Layers
Module 12	
July 17 - July 21	Features of Wireless Links/ WiFi
Module 13	
July 22 - July 26	Cellular Network/ Manage Mobility
Module 14	
July 27 - July 31	Group Project Overviews Final Exam

Disclaimer

The module may be modified at the discretion of the instructor or in the event of extenuating circumstances. Students will be notified in the class of any changes to the modules.

Student Conduct

The NJIT University code on academic integrity, found at <http://www.njit.edu/academics/integrity.php> (Links to an external site.), will be followed in all courses.

Students with Disabilities Codes

NJIT adheres to section 504 of the Rehabilitation Act (ADA) of 1990. Appropriate accommodations are provided at no cost to the student. If you have any questions or would like additional information, please contact Dr. Phyllis Bolling, Center for Counseling and Psychological Services (C-CAPS), Campbell Hall, (entry-level), room 205, (973) 596-3420. For further information, visit the [Disability Support Services \(Links to an external site.\)](#) website.

Technical Support

For assistance with the following items, please contact NJIT IST Service Desk at: 1-973-596-2900 or <https://ist.njit.edu/servicedesk/> (Links to an external site.)

*NJIT passwords may be changed using the [Global Password Change mechanism \(Links to an external site.\)](#). You will need to know your current UCID and UCID password. Questions can be referred to as 1-973-596-2900.

Periodic changing of passwords and strategies for managing them is best practice for anyone using a computer. All members of the university community are encouraged to review [tips for password management \(Links to an external site.\)](#) and to change passwords regularly.