

Syllabus

CS422: COMPUTER NETWORKS

Spring 2019

Instructors:	Adib Rastegarnia, He Wang	Time:	11:30am-12:20pm MWF
Email:	arastega@purdue.edu	Place:	LWSN 1106.
Office Hours:	by appointment		

Course Pages:

1. <http://courses.cs.purdue.edu/cs42200:spring19:start>
2. For grades, you should check blackboard using your Purdue account:
<http://mycourses.purdue.edu/>

Course Description:

This is an extensive and thorough senior-level course in computer networking and internetworking; it covers all aspects of data networking. The course material has been divided into six modules:

- Course introduction: syllabus; instructor; TAs; topics; requirements; expectations. The Network Edge, Core, and Access Networks; Physical Media; Protocol Layers and Their Service Models; The structure of the Internet.
- Principles of Application-Layer Protocols; Network programming with a simplified API; Socket Programming; The World Wide Web: HTTP, File Transfer: FTP, Electronic Mail in the Internet; The Internet's Directory Service: DNS; Peer-peer systems
- Data communications: low-level details of media, signals, and transmission of bits; concepts of time division and frequency division multiplexing; encoding; modulation; bandwidth, throughput, and noise.
- The Data Link Layer: Introduction, Services ; Error Detection and Correction; Multiple Access Protocols and LANs; LAN Addresses and ARP; Ethernet; VLANs
- Internetworking: Internet architecture; IPv4 and IPv6; IP addressing; address binding; datagram encapsulation and fragmentation; datagram forwarding; support protocols; transport protocols UDP and TCP; retransmission; protocol ports; ICMP and error handling. Routing algorithms and Internet routing protocols.
- Transport-Layer Services and Principles; Multiplexing and Demultiplexing Applications; Connectionless Transport: UDP; Principles of Reliable of Data Transfer; Connection Oriented Transport: TCP; Principles of Congestion Control; TCP Congestion Control
- Cross-layer technologies: network performance and performance measures; QoS; multimedia and IP telephony (VoIP); network security; traffic engineering and MPLS; network management.
- Emerging topics: Software Defined Networking; SDN architecture and controllers; OpenFlow; The Internet of Things; wireless mesh networks.

Textbooks:

- Douglas Comer, Computer Networks And Internets, sixth edition, Prentice-Hall, 2014.
- Computer Networking - A Top Down Approach, James F. Kurose and Keith W. Ross.

Prerequisites:

Students should be able to understand and write complex programs in C and Java. In addition, they should be familiar with system development tools.

Grading Policy:

Students will solve homework problems, and take in-class exams and quizzes. In addition, each student will be given a lab exercise once per week. Labs (PSOs) will provide hands-on experience with networking equipment, and give students an opportunity to write applications that communicate over the Internet as well as analyze packets. A grade will be assigned as follows:

Quizzes	5%
Homework problems	10%
Programming exercises (Labs)	45%
Examinations (midterm and final)	40%
Bonus for class participation	2%

Mailing Lists:

Please send your questions, concerns, and comments to the TAs mailing list: cs422-ta@cs.purdue.edu

PSO Schedule

Section	Time	Location	TA
P01	Thursdays - 11:30am - 1:20pm	HAAS G056	Adib Rastegarnia
P02	Fridays - 9:30am-11:20am	LWSN B158	Runzhi Yang

Note: There will be no PSOs the first week of classes.

Switching PSO Sections

Because equipment in the lab is limited, you may not switch PSO sections unless you find someone in another section who is willing to swap with you.

Late Submission Policy

To help manage unexpected scheduling demands, each student is given **Three** late days in total that may be used for late submissions of only **programming assignments**. For example, you may submit 1 day late on three programming assignments, or 3 days late on one programming assignment. Any combination is valid as long as the total days delayed does not exceed 3.

Academic Integrity:

Behavior consistent with cheating, copying, and academic dishonesty is not tolerated. Depending on the severity, this may result in a zero score on the assignment or exam, and could result in a failing grade for the class or even expulsion. Purdue prohibits dishonesty in connection with any University activity. Cheating, plagiarism, or knowingly furnishing false information to the University are examples of dishonesty. (Part 5, Section III-B-2- a, University Regulations) Furthermore, the University Senate has stipulated that the commitment of acts of cheating, lying, and

deceit in any of their diverse forms (such as the use of substitutes for taking examinations, the use of illegal cribs, plagiarism, and copying during examinations) is dishonest and must not be tolerated. Moreover, knowingly to aid and abet, directly or indirectly, other parties in committing dishonest acts is in itself dishonest. (University Senate Document 7218, December 15, 1972). You are expected to read Purdues guide to academic integrity:

http://www.purdue.edu/purdue/about/integrity_statement.html

- **Programming assignments and homeworks:** It is permissible to discuss programming assignments and homeworks with other students in this class or use of high-level reference materials in the library or online. If you do this, you will be expected to clearly disclose with whom you discussed the ideas, or to cite the references used. Failure to do so will be considered cheating or plagiarism. Collaboration that entails discussing specific methods of solution is not allowed. This includes discussing and sharing of code. The source codes and solutions that students turn in must be their own and they must completely understand the solutions they submit.

Changes for Emergencies

In the event of a major campus emergency, course requirements, deadlines and grading percentages are subject to change that may be necessitated by a revised semester calendar or other circumstances. If an emergency occurs, you can consult the CS web page for details.

Emergencies and campus closings will be announced on local media and on the main Purdue University web site <http://www.purdue.edu>. Individuals may subscribe to an SMS text announcement service. Other details are on the Purdue emergency preparedness site.

Students with Disabilities:

Purdue University is required to respond to the needs of the students with disabilities as outlined in both the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990 through the provision of auxiliary aids and services that allow a student with a disability to fully access and participate in the programs, services, and activities at Purdue University. If you have a disability that requires special academic accommodation, please make an appointment to speak with the instructor within the first three (3) weeks of the semester in order to discuss any adjustments. It is the students responsibility to notify the Disability Resource Center (<http://www.purdue.edu/drc>) of an impairment/condition that may require accommodations and/or classroom modifications. We cannot arrange special accommodations without confirmation from the Disability Resource Center.

Attendance:

Students are expected to be present for every meeting of the classes in which they are enrolled. Only the instructor can excuse a student from a course requirement or responsibility. When conflicts or absences can be anticipated, such as for many University sponsored activities and religious observations, the student should inform the instructor of the situation as far in advance as possible and plan to make up for missed work.