CS/ECE 372 - Introduction to Computer Networks (Spring 2017)

Syllabus

1. Course Information:

Instructor: Dr. Attila Altay Yavuz,
Classroom: WNGR 151
Email: Attila.Yavuz@oregonstate.edu
URL: http://web.engr.oregonstate.edu/~yavuza/Courses/Spring2017_IntroComputerNetworks
Class Hours: TR 12:00 – 1:20 PM

Introduction to wired/wireless network principles, organization, topologies, hardware, applications, and protocols in the OSI hierarchy context. Internet protocols, packet forwarding, and routing. Basic network security concepts, private/public key cryptography, key management for internet and PKI. Some important topics to be covered, including but not limited to:

- Data-link layer services and functions
- Introduction to computer networks and the Internet
- Network layer addressing and routing
- Transport layer principles and reliable data transfer
- Network security: Foundational security services
  - Role of basic cryptography in computer networks, public key infrastructure, SSL/TLS

At the completion of the course, students are expected to be able to…

1. Describe the hardware devices used to create a network.
2. Give examples of networking technologies, and examine the associated standards
3. Describe the essential features of a networking protocol
4. Describe various congestion control, error detection, and error correction schemes
5. Explain (simulate) the processes of packet construction, packet switching, and packet deconstruction
6. Apply a route discovery algorithm to determine the shortest path in an internet represented as a weighted graph
7. Compare/contrast cable networking and wireless networking
8. Explain a variety of networking services, such as DNS, NAT, and ARP
9. Associate networking functions with the appropriate layers of the ISO/OSI network layering model, and associate internetworking functions with the appropriate layers of the TCP/IP layering model
10. Explain the concept of packet-switching, and identify and analyze the different types of packet delay in packet-switched networks
11. Describe the essential principles of a transport layer protocol (reliable data transfer, flow control, congestion control)
12. Use IP addressing and apply routing algorithms to find shortest paths for network-layer packet delivery
13. Use networking tools to observe and analyze behaviors of networking protocols
14. Describe and compare data link layer services and multiple access techniques
15. Describe network security issues and some of the methods that address them
16. Describe basic concepts on network security
17. Explain symmetric and asymmetric cryptography, and their role in network security
18. Describe public key infrastructure concept

Credits: 4

Prerequisites: CS 261 (data structure) and basic mathematical/probability skills.

2. Learning Resources:
   • Kurose and Ross, Computer Networking: A Top-Down Approach Featuring the Internet, Addison Wesley
   • Wireshark (http://www.wireshark.org/)

3. Coursework and evaluations:

   • Assignments (30%)
     • 5 homework (with extra credit question(s))
     • Optional take-homes, extra credit
   • Labs (%15)
     • 5 lab assignments
   • Midterm (%25)
   • Final (%30)

4. Schedule of Assignments:

The scheduling of assignments and requirements are announced at the course website (and updated if required).

5. Policies on incomplete grades and late assignments:
Late homework assignments are not accepted (see below for the exceptions).

6. Policies on absences (excused/ unexcused) and scheduling makeup:
There will be no makeups for mid-term, final and assignments. Only exceptions is possible, if a student presents a police report or a doctor's note that show some emergency situation.
7. Student with disabilities

Accommodations are collaborative efforts between students, faculty and Disability Access Services (DAS). Students with accommodations approved through DAS are responsible for contacting the faculty member in charge of the course prior to or during the first week of the term to discuss accommodations. Students who believe they are eligible for accommodations but have not yet obtained approval through DAS should contact DAS immediately as 737-4098. (revised: 2011-02-15)

8. Academic integrity:

The university policies against academic dishonesty will be strictly enforced. Evidence of academic dishonesty in this course may result in a grade of "F" on the examination/assignment that involved cheating and/or an "F" in the course (for more details see http://ecampus.oregonstate.edu/services/proctoring/academichonesty.htm).

The instructor expects a student to complete his/her homework and assignments without violating academic Integrity. A student’s submission on any homework, projects and assignments indicates that the student neither gave nor received unauthorized aid.