CS4471: Computer Networks Configuration and Management (Spring 2020)

Time and Location:
Lecture Time: Saturday, 11:30am-2:00pm
Lab Time: arranged by students
Lecture Location: FA219
Lab Location: ET B106

Lab rule:
There is to be no food or drink in the lab. Please turn off your computer monitors when you leave.

Instructor:
Senhua Yu, Ph.D.
Office: ET A225
Email: syu38@calstatela.edu
Office hours: Saturday, 11:00am-11:30am or 2:00pm-2:30pm

Course description:
This course will expose students to computer network concepts and provide practical hands-on experience through the use of a computer network lab and/or network simulation software. By the end of the course, successful students will be able to demonstrate understanding in the following areas:

- Network devices such as router, switch, bridge, hub, transceiver, NIC, cabling
- Ethernet and Wireless LANS
- Capturing and decoding Ethernet packets
- Configuration of Cisco switches and routers
- IPv4 and IPv6 Routing
- Security and Access Control Lists
- Network protocols such as TCP/IP, ARP, ICMP, STP, SNMP, DHCP, and OSPF
- Automation

Pre-requisites:
Understanding of operating systems (CS4440) or computer network (CS4470)

Required textbook:

Recommended equipment and references:
- USB to Ethernet adapter; USB to RS232 serial port adapter
- Cisco Networking Academy https://www.netacad.com/
- Cisco Packet Tracer 7.3.0 (MS Windows, Mac OS, & Linux) http://cs3.calstatela.edu/%7Eegean/cs4471/software/Cisco%20Packet%20Tracer%207.3.0/
- Cisco Learning Network https://learningnetwork.cisco.com/welcome
- Wireshark Packet Sniffer https://www.wireshark.org/
- GNS3 Network Simulator https://gnss3.com/
- Cisco DEVNET Sandbox https://developer.cisco.com/site/sandbox/

Grading policy:
- Attendance: 5%
• Lab assignments: 25%
• Midterm: 35%
• Final exam: 35%

Attendance grading rubric:

0 unexcused absences: 5 points; 1 unexcused absences: 3 points; 2 unexcused absences: 0 points; 3 or more unexcused absences: your final grade will be “WU”. Unexcused tardy (< 15 minutes late) is equivalent to ½ absence. Leaving early unexcused is considered a full absence. Excused absences include sickness with doctor proof, approval from department chair, and other excuses defined at http://ecatalog.calstatela.edu/content.php?catoid=22&navoid=2180#missed_class

A [90, 100]; A- [85, 90); B+ [80, 85); B [75, 80); B- [70, 75)
C+ [65, 70); C [60, 65); C- [55, 60); D [50, 55); F < 50;
(The scheme is tentative and may be subject to changes)

Course policy:

Late policy: All assignments are due on the date and time posted. Assignments may be submitted up to 1 day late, and late submission will be scored out of 90 instead of 100. No homework/report will be accepted more than 1 day after the assigned due date, unless medically impossible (a doctor's note stating that you were medically incapable of doing the homework during the entire period between the due date and your submission date of the homework is needed).

For the lab projects: They are collaborative projects with a team of up to four students. Between different teams, discussions of the physical lab are welcome, but exchanges of the ideas of the written lab are not allowed. The use of reference materials in the library or online is allowed, provided that the homework/report explicitly cites the references used. Note that copying the solutions from online sources is still considered cheating even if you cite the sources.

Exam: If you miss an exam because of sickness or similar reasons, visit a physician and obtain a note detailing the period during which you were medically incapable of taking the exam. Notify the instructor immediately via e-mail or telephone (voice mail) if you are going to miss an exam, before the exam takes place unless medically impossible. See your instructor as soon as you return to class. If you miss an exam without a valid excuse, you will receive a zero grade for that exam. No make-up exam will be available without a valid excuse.

Academic honesty:

No tolerance on cheating! FAIL the course on the FIRST attempt!
Consult the University Statement on Academic Integrity:
http://ecatalog.calstatela.edu/content.php?catoid=1&navoid=26

***********************This syllabus may be subjected to changes**************************
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<tr>
<th>Week# (Date)</th>
<th>Lecture</th>
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| 1 1/25      | Vol 1 Part I: Intro to Networking  
CCNAv1 Chapter 1: intro to TCP/IP Networking  
CCNAv1 Chapter 2: Fundamentals of Ethernet LANS  
| 2 2/1       | Vol 1 Part II: Implementing Ethernet LANS  
CCNAv1 Chapter 4: Using Command-Line Interface  
CCNAv1 Chapter 5: Analyzing Ethernet LAN Switching  
CCNAv1 Chapter 6: Configuring Basic Switch Management  
CCNAv1 Chapter 7: Configuring and Verifying Switch Interfaces | Network Wiring and Physical Topology |
| 3 2/8       | TBA | Cisco Packet Tracer Introduction |
| 4 2/15      | Vol 1 Part III: Implementing VLANS and STP  
CCNAv1 Chapter 8: Implementing Ethernet Virtual LANs  
CCNAv1 Chapter 9: Spanning Tree Protocol Concepts  
CCNAv1 Chapter 10: RSTP and EtherChannel Configuration | Vlan & Inter-Vlan Routing |
| 5 2/22      | Vol 1 Part IV: IPv4 Addressing  
CCNAv1 Chapter 11: IPv4 Subnetting  
CCNAv1 Chapter 12: Analyzing Classful IPv4 Networks  
CCNAv1 Chapter 13: Analyzing Subnet Masks  
CCNAv1 Chapter 14: Analyzing Existing Subnets | Spanning-Tree Protocol |
| 6 2/29      | Vol 1 Part V: IPv4 Routing  
CCNAv1 Chapter 15: Operating Cisco Routers  
CCNAv1 Chapter 16: Configure IPv4 Addresses and Static Routes  
CCNAv1 Chapter 17: IP Routing in the LAN  
CCNAv1 Chapter 18: Troubleshooting IPv4 Routing | Wireshark Packet Capture and Decode |
| 7 3/7       | Vol 1 Part VI: OSPF  
CCNAv1 Chapter 19: Understanding OSPF Concepts  
CCNAv1 Chapter 20: Implementing OSPF  
CCNAv1 Chapter 21: OSPF Network Types and Neighbors | Cisco Router and Switch Configuration |
<p>| 8 3/14      | <strong>Midterm</strong> | OSPF |</p>
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<tr>
<th>Week</th>
<th>Date</th>
<th>Vol 2 Parts</th>
<th>CCNAv1 Chapters</th>
<th>CCNAv2 Chapters</th>
<th>Notes</th>
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| 10   | 3/28 |  | CCNAv1 Chapter 22: Fundamentals of IP version 6  
CCNAv1 Chapter 23: IPv6 Addressing and Subnetting  
CCNAv1 Chapter 24: Implementing IPv6 Addressing on Routers  
CCNAv1 Chapter 25: Implementing IPv6 Routing |  |  |  |
| 11   | 4/4  |  |  |  |  |
| 12   | 4/11 |  | Vol 1 Part VIII: Wireless LANS  
CCNAv1 Chapter 26: Fundamentals of Wireless Networks  
CCNAv1 Chapter 27: Analyzing Cisco Wireless Networks  
CCNAv1 Chapter 28: Securing Wireless Networks  
CCNAv1 Chapter 29: Building a Wireless LAN |  | Spring Break (no class) | Access Control List |
| 13   | 4/18 |  | Vol 2 Part 1: IP ACL  
CCNAv2 Chapter 1: Intro to TCP/IP Transport (TCP &UDP) and Applications  
CCNAv2 Chapter 2: Basic IPv4 ACLs  
CCNAv2 Chapter 3: Advanced IPv4 ACLs |  |  |  |
CCNAv2 Chapter 4: Security Architectures  
CCNAv2 Chapter 5: Securing Network Devices  
CCNAv2 Chapter 6: Switch Port Security  
CCNAv2 Chapter 7: Implementing DHCP  
CCNAv2 Chapter 8: DHCP Snooping and ARP Inspection |  |  |  |
| 15   | 5/2  |  | Vol 2 Part 3: IP Services  
CCNAv2 Chapter 9: Device Management Protocols (Syslog, NTP, CDP, LLDP)  
CCNAv2 Chapter 10: Network Address Translation  
CCNAv2 Chapter 11: QOS  
CCNAv2 Chapter 12: Misc (FHRP, SNMP, FTP, TFTP) |  |  | TBA |
| 16   | 5/9  |  | Vol 2 Part 4: Network Architecture  
CCNAv2 Chapter 13: LAN Architecture  
CCNAv2 Chapter 14: WAN Architecture (Metro Eth, MPLS, Internet VPNs)  
CCNAv2 Chapter 15: Cloud Architecture |  |  |  |
| 17   | 5/16 |  | Vol 2 part 5: Network Automation  
CCNAv2 Chapter 16: Intro to Controller-Based Networks  
CCNAv2 Chapter 17: Software Defined Access  
CCNAv2 Chapter 18: REST and JSON  
CCNAv2 Chapter 19: Ansible, Puppet, and Chef |  | Final Exam |  |