Computer Network

FALL, 2024

INSTRUCTOR: Chenli
OFFICE:
EMAIL: cl@scu.edu.cn
OFFICE HOURS: 3–4 hours per class
LECTURES: Every Tuesday 13:50-16:25 (Weeks 1-17) and 16:35-18:25 (Weeks 7-16)
RECITATION:
TEXTBOOK: Computer Networks (5th Edition)
TEACHING ASSISTANT: Zhou sirui

PREREQUISITE:
Students are expected to have a fundamental understanding of computer systems and basic programming concepts. Prior knowledge of operating systems, data communication, and network fundamentals will be beneficial but is not mandatory. A solid foundation in mathematics, particularly in probability and discrete mathematics, is recommended for grasping key networking principles.

DESCRIPTION:
 This course provides a comprehensive introduction to computer networks. It covers essential networking concepts, including network architecture, protocols, and key technologies. Topics include the OSI and TCP/IP models, data link and transport layer protocols, network security, wireless networking, and multimedia communication. Through theoretical study and practical exercises, students will gain a deep understanding of how modern networks operate and develop hands-on skills in network design, configuration, and troubleshooting.

COURSE OBJECTIVES:
Through the study and practice of this course, students will be able to systematically and comprehensively grasp the fundamental concepts, principles, and technologies of computer networks. They will gain an understanding of the technical characteristics, differences, development, and practical applications of major computer network hardware and software products. Additionally, students will develop strong skills in the installation, configuration, and maintenance of computer network hardware and software. This course lays a solid theoretical and practical foundation for future research and professional work in computer networks, as well as for the study of related specialized courses.

LEARNING OUTCOMES/APPLICABLE ABET STUDENT OUTCOMES FOR THIS COURSE:
1) Students will demonstrate an understanding of the key concepts and protocols at each layer of the TCP/IP models, and be able to explain how these layers interact and contribute to network communication.
2) Students will be able to analyze and apply various network protocols and technologies in designing and managing computer networks.
3) Students will develop the skills to install, configure, troubleshoot, and maintain computer networks, including both hardware and software components.

GRADE DETERMINATION:
 The regular assessment is 30%, the laboratory course assessment is 30%, and the final exam is 40%.

EXAMS:
The final exam will assess the students' comprehensive understanding of the entire course content, including key concepts, protocols, and practical applications. It will account for 40% of the total grade.

QUIZZES:
Quizzes will be administered periodically throughout the course to assess students' understanding of specific topics. They will contribute 15% to the overall grade and will help reinforce the material covered in lectures and practical exercises.

GRADE REBUTTAL:
If a student believes there has been an error in grading or in the assessment of their work, they may submit a formal grade rebuttal. The student must present their concerns in writing, along with supporting evidence, within one week after the graded material is returned. The instructor will review the submission and respond accordingly.

HOMEWORK:
Homework assignments will be given throughout the course to reinforce the material learned in class. These assignments will make up 10% of the final grade. Students are expected to complete all homework on time. Late submissions may be penalized unless an extension is granted in advance for valid reasons.

ATTENDANCE:
Students are expected to maintain a good attendance record and must attend all lectures and laboratory sessions. Attendance will be monitored and will account for 5% of the final grade.

MAKE-UP POLICY:
In case of an excused absence, students are allowed to make up missed exams or homework assignments. The student must inform the instructor of the absence in advance or provide valid documentation (e.g., medical note) to qualify for a make-up.

MATERIAL COVERED: The sequence of the sections covered in this class is:

Week	Contents	Descriptions	
1 (02/25)	1.1 – 1.3	Component of computer network, referenced model	
2 (03/04)	1.6-2.4	performance metrics, transmission media, data communication	
3 (03/11)	2.5 – 3.2	Multiplexing, PSTN, GSM, error-correcting code, error-detecting code	
4 (03/18)	3.3 – 4.2	Sliding window, MAC protocols	
5 (03/25)	4.3,4,4	802.3,802.11	
6 (04/01)	4.8, 5.1	Switch, virtual circuit	
7 (04/08)	5.2,5.5	Routing algorithm , fragmentation	quiz 1 on 4/8 4:00 – 4:25 pm
		Lab 1： Familiarization with Packet Tracer	
8 (04/15)	5.6	IP address, IP protocol, IPv6	
		Lab 2： VLAN configuration	
9 (04/22)	5.6	ICMP,MPLS	
		Lab 3： ARP protocol analysis	
10 (04/29)	5.6	Routing protocols	
		Lab 4: ICMP protocol analysis	
11 (05/06)	6.1-6.4	Transport layer, UDP	Exam2 on 5 / 6 4:00 – 4:25 pm

		Lab 5：router configuration	
12 (05/13)	6.5	TCP protocol	
		Lab 6：NAT Configuration	
13 (05/20)	6.5	TCP flow control, TCP congestion control	
		Lab 7: OSPF Configuration	
14 (05/27)	7.1	DNS	Exam2 on 5 / 27 4:00 – 4:25 pm
		Lab 8: UDP, TCP protocol Analysis	
15 (06/03)	7.3	WWW	
		Lab 9: DNS protocol Analysis	
16 (06/10)	7.2	Email,	
		Lab 10：HTTP Protocol Analysis	
17 (06/17)	10.1 – 10.4 intro	Final Exam Week	