

EE 450 – Introduction to Computer Networks

Units: 3

Term—Day—Time: TTh 2 to 3:20 PM

Discussion: Mondays 5 to 5:50 PM, SOS B4

Location: LVL 16

Instructor: Prof. Cauligi Raghavendra

Office: EEB 216

Office Hours: Tue and Wed 3:30 to 5 PM

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Catalogue Course Description

Network architectures; layered protocols, network service interface; local, wide area, and wireless networks; Internet protocols; link protocols; addressing; routing; flow control; software defined networks; data centers.

Learning Objectives

Students will learn fundamentals of computer networks, main protocols and applications of the Internet, design and analysis of networks, use of software tools for understanding workings of the Internet.

Writing socket programming to learn about protocols and applications and use of Mininet for emulation

Registration Restriction: Open only to junior standing and above

Crosslisted as CSCI 450

Course Notes

Textbook

Technological Proficiency and Hardware/Software Required

Students are required to have basic familiarity of programming and elementary probability theory.

Required Readings and Supplementary Materials

Required textbook “Computer Networking: A Top Down Approach” by James Kurose and Keith Ross, 7th Ed., Pearson Publishers.

Supplementary materials are tutorial notes on Unix, C, C++ user guides.

Description and Assessment of Assignments

This course based on established materials from a widely used textbook. There will be weekly home works and quizzes with problems on materials covered in class, programming projects.

Grading Breakdown

Assignment	Points	% of Grade
Home Works	5	
Programming Projejects	15	
Quizzes	10	
Mid Term Exam	30	
Final Exam	40	
TOTAL	100	0
TOTAL		

Assignment Submission Policy

Assignments are assigned weekly and due in class the following week. Programming projects and mininet exercises are explained and assigned in discussion section.

Additional Policies

Course Schedule: A Weekly Breakdown

	Topics/Daily Activities	Readings and Homework	Deliverable/ Due Dates
Week 1 Dates	Introduction and overview of course Network elements, Internet, Protocols, Physical media	Chapter 1	
Week 2 Dates	Packet and message switching; performance, metrics; protocol layers; Link Layer	Chapter 1	Home Work 1 Quiz 1
Week 3 Dates	Error Detection and Correction; Ethernet	Chapter 6	Home Work 2 Quiz 2
Week 4 Dates	Multiple Access protocols, CSMA/CD, Data Centers	Chapter 6	Home Work 3 Quiz 3
Week 5 Dates	Applications, Web and HTTP, e-mail, SMTP	Chapter 2	Home Work 4 Programming Project 1 assigned
Week 6 Dates	DNS, HTTP, P2P applications,	Chapter 2	Home Work 5 Quiz 4
Week 7 Dates	Transport Layer Protocols; TCP and UDP	Chapter 3	Home Work 6 Quiz 5
Week 8 Dates	Flow and Congestion Control; MID TERM	Chapter 3	Programming Project 1 due
Week 9	TCP Congestion Control	Chapter 3/4	Home Work 7

Dates	Data and Control Planes		Quiz 6 Programming Project 2 assigned
Week 10 Dates	IP and Network Layer, Forwarding	Chapter 4	Home Work 8 Quiz 7
Week 11 Dates	Forwarding and Routing Algorithms, SDN	Chapter 5	Home Work 9 Quiz 8
Week 12 Dates	Broadcasting, Multicasting, and Network management	Chapter 7	Home Work 10
Week 13 Dates	Wireless and Mobile Networks	Chapter 8	Home Work 11
Week 14 Dates	Mobility, Mobile IP, and Network Security	Chapter 9	Home Work 12
Week 15 Dates	Advanced Topics and Course review		Programming Project 2 due
FINAL Date			Date: For the date and time of the final for this class, consult the USC <i>Schedule of Classes</i> at www.usc.edu/soc .

Statement on Academic Conduct and Support Systems

Academic Conduct

Plagiarism – presenting someone else’s ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in *SCampus* in Section 11, *Behavior Violating University Standards* <https://scampus.usc.edu/1100-behavior-violating-university-standards-and-appropriate-sanctions>. Other forms of academic dishonesty are equally unacceptable. See additional information in *SCampus* and university policies on scientific misconduct, <http://policy.usc.edu/scientific-misconduct>.

Discrimination, sexual assault, and harassment are not tolerated by the university. You are encouraged to report any incidents to the *Office of Equity and Diversity* <http://equity.usc.edu> or to the *Department of Public Safety* <http://adminopsnet.usc.edu/department/department-public-safety>. This is important for the safety of the whole USC community. Another member of the university community – such as a friend, classmate, advisor, or faculty member – can help initiate the report, or can initiate the report on behalf of another person. *The Center for Women and Men* <http://www.usc.edu/student-affairs/cwm/> provides 24/7 confidential support, and the sexual assault resource center webpage <http://sarc.usc.edu> describes reporting options and other resources.

Support Systems

A number of USC’s schools provide support for students who need help with scholarly writing. Check with your advisor or program staff to find out more. Students whose primary language is not English should check with the *American Language Institute*

<http://dornsife.usc.edu/ali>, which sponsors courses and workshops specifically for international graduate students. *The Office of Disability Services and Programs* http://sait.usc.edu/academicsupport/centerprograms/dsp/home_index.html provides certification for students with disabilities and helps arrange the relevant accommodations. If an officially declared emergency makes travel to campus infeasible, *USC Emergency Information* <http://emergency.usc.edu> will provide safety and other updates, including ways in which instruction will be continued by means of blackboard, teleconferencing, and other technology.