EE 60554: Communication Networks

Instructor: Prof. Martin Haenggi, 274 Fitzpatrick, mhaenggi@nd.edu
Lecture: TH, 75min
Offered: Alternate Years
Text: Dimitri Bertsekas and Robert Gallager, Data Networks (2nd Ed.), Prentice Hall
      Available at http://lrcwww.epfl.ch/PS_files/NetCal.htm

Description

Review of the OSI model and TCP/IP. Introduction to queueing systems and network calculus. Network traffic modeling, M/M/1 and related queues, min-plus algebra, arrival and service curves.

Course Outline

• Review of the OSI model, TCP/IP, UDP/IP, IPv6, and Internet applications (e-mail, web).
• Fundamentals of Markov systems, queueing models and theory, stochastic traffic modeling. Little’s theorem and Jackson networks.
• Network calculus: Min-plus algebra applied to network analysis. Arrival and service curves, min-plus convolution, sub-additive functions, rate functions, backlog, virtual delay, burst tolerance and leaky buckets.

Additional References

• Dimitri Bertsekas and Robert Gallager, Data Networks, 2nd Ed., Prentice-Hall,1992
• Srinivasan Keshav, An Engineering Approach to Computer Networking, Addison-Wesley, 1997