EC541 Computer Communication Networks
Syllabus

Description: This is a graduate-level course on performance analysis of communication networks. The objective of the course is to introduce popular mathematical models of computer communications and analytic techniques to quantify critical performance issues. The emphasis is on recent developments that apply to modern communication networks.

Topics: We expect to cover the following topics in the class:
- Review of fundamental concepts in computer networking
- Queueing and delay models in communication networks
- Little Theorem
- Probability refresher
- The Poisson process and its properties
- Embedding procedures
- The M/M/1 queueing model
- Multi-server queues
- State-diagrams and Markov chains
- Applications of Markov chains and queuing models
- The paradox of residual life
- The M/G/1 queueing model
- Priority queueing systems
- Polling and reservation systems
- Network simulation
- Jackson networks
- Closed queueing networks
- Reversibility and Burke’s theorem
- Kelly and Whittle Networks


Other references:

- L. Kleinrock, Queueing systems Vol. 1, Wiley, 1975
- M. Schwartz, Broadband integrated networks, Prentice-Hall, 1996