Overview: The objective of the course is to develop mathematical models that allow the study of scheduling and resource allocation problems for wired and wireless networks. Topics covered will include opportunistic scheduling, quality of service and fairness for networks with time-varying channels. In addition, we will also study related topics such as switch scheduling for Internet routers.

The course will develop mathematical techniques for asymptotic analysis of communication networks. This includes fluid limits, diffusion limits, large deviations and stochastic differential equations.

Pre-requisites: You will need to have a good background in Probability and Random Processes (EE 381J or equivalent), as well as a graduate course on communication networks Analysis (EE 381K-13 or equivalent). In addition, a course in real analysis (M 365C or equivalent) will be highly desirable. This is an ADVANCED course, which for the most part will be taken by second or third year students in ECE, OR or CS.

Textbook: Handouts and notes will be provided. In addition, we will discuss various papers on suitable topics. A suggested reference book is B. Oksendal, “Stochastic Differential Equations,” Springer.

Format: Homework (25%), paper presentations (25%) and a final project (50%). The details will be discussed in the first class.

Class Hours: Class will be held on Mondays and Wednesdays, 9:30 - 11:00 pm in ENS 116.
List of papers covered in class:


