



# Telecommunication Networks

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## Course Description

In this course, we trace the evolution of telecommunication networks and identify the key concepts and functions that form the basis for layered architecture. We analyze protocols and services in different layers using models from queuing theory and algorithms from graph theory. In more detail, we explain fundamental concepts such as digital modulation techniques, medium access control protocols, automatic repeat request methods, different routing algorithms and protocols, and sliding window-based techniques. The main focus of this course is on the analysis of data networks specially Internet protocols.

## Required Texts and Useful References

- Andrew S. Tanenbaum and David J. Wetherall. "Computer Networks". *Prentice Hall Press*, Upper Saddle River, NJ, USA, 2010.
- Dimitri Bertsekas and Robert Gallager. "Data Networks". *Prentice-Hall, Inc.*, Upper Saddle River, NJ, USA, 1992

## Course Content

- Introduction and layered network architecture
- The physical layer channel and models
- Point-to-point protocols and data link layer
- An introduction to queuing theory and delay models in data networks
- Multi-access communication and medium access control sub-layer
- Routing in data networks and network layer design issues
- The Transport Layer and flow control techniques
- An introduction to the application layer

## Grading Policy

- Assignments 25%
- Class Project 10%
- Midterm Exam 15%
- Final Exam 50%