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## Communications networks B

### Finalità

Objective of the course is to provide the basic tools and understanding for the performance analysis of modern telecommunications networks.

### Programma

Historical perspective on telecom networks. Multiplexing. Switching. Multiple access. Elementary performance analysis. Little's law. Traffic intensity. Throughput. Loss probability. Poisson process. Renewal processes. The M/G/1 queue with applications. PK formula. Vacancies. Priorities. Local area networks performance. TDMA, FDMA. Aloha. Ethernet. Token ring. Polling systems. Performance of wide area networks. Kleinrock's formula. Optimal routing. Topology. Moore bound. Advanced performance analysis. Discrete time Markov chains. Applications. Geo/Geo/1, slotted Aloha, M/G/1, minislotted Ethernet. Absorbing chains. Continuous time Markov chains. Applications. : M/M/1, M/M/c, M/M/c/c, M/M/c/c/N. Networks of queues. Burke's theorem. Open networks and Jackson's theorem. Jackson's for closed networks. Sliding window flow control. Norton's theorem. . Buzen's algorithm . Mean value analysis. For more details on lectures, please consult the Instructor's web site.

### Modalità d'esame

both written and oral

### Propedeuticità

Geometria B

### Testi consigliati

[1] D. P. Bertsekas, R. Gallager, Data Networks, Prentice Hall.