Topics: Stochastic Models in Operations Research (61214)

Instructors: E.KYRIAKIDIS

Core Course, 2nd semester, 3.5 ECTS units
Course level: Graduate (MSc)
Language: English

Course Description

Poisson Process (definition, examples). Non-homogeneous Poisson process (definition examples). Simple birth-death process (definition, transient probabilities, probability of annihilation of population). Queueing theory. Little formula. Queue M/M/1 (transient probabilities, limiting probabilities). Exponential model of a queueing system with one server and finite capacity. Queue M/M/k with finite capacity. Queue M/M/k with inifinite capacity. Networks of queues (open systems). Networks of queues (open systems). Queue M/G/1 (formula of Pollaczek-Khintchine). Ουρά M/G/1 with bulk arrivals. A stochastic models for inventory control. The policy (s,S). Renewal processes with cost (examples).

Prerequisites
Basic knowledge of probability.

Target Learning Outcomes

- The students will be able to compute various quantities of interest as the stationary probabilities of a stochastic process, the mean number of customers in a queueing systems.
- They will also be able to find the optimal policy for the control of a stochastic system.
- They will be able to compute the long-run expected average cost of a renewal process.

Recommended Bibliography

- S. M. Ross, An introduction to Probability Models
- H. C. Tijms, A First Course in Stochastic Models.

Teaching and Learning Activities
In class, assignments, presentations.

Assessment and Grading Methods
Written Examination. Assignments.