Stochastic Models in Operations Research

Instructor: E.KYRIAKIDIS

Course Code: 61214
Course Type: Elective of Course Group 3
Course Level: Graduate (MSc)
Year of Study: A'
Semester: 2nd
ECTS: 3
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.