Аннотация

Теория массового обслуживания

This course gives a detailed introduction into queueing theory along with

insights into stochastic processes and simulation techniques useful for

modeling queueing systems. A queue is a waiting line, and a queueing system is

a system which provides service to some jobs (customers, clients) that arrive

with time and wait to get served. Examples are:

- a telecommunication system that processes requests for communication;

- a hospital facing randomly occurring demand for hospital beds;

- central processing unit that handles arriving jobs.

Queueing theory is a branch of probability theory dealing with abstract

representation of such systems. It helps obtain useful and unobvious answers to

questions concerning waiting times for both jobs and servers, like “how much

nodes should a server have, so that a customer would not have to wait more than

… on average?” or “what is the mean queue length corresponding to a certain

capacity utilization level?” Such questions arise, for example, in computer

systems performance evaluation.

These problems require knowledge of stochastic processes, therefore the course

provides a review of point processes (Poisson, Erlang etc.) and Markov chains

in discrete and continuous time, paying special attention to a birth-death

process, often used in queueing models. It also includes a detailed insight

into simulation, because queueing problems often do not have analytic solution.

The course is aimed at students interested in applied probability, Monte Carlo

simulation and computer systems performance evaluation.