Performance evaluation of networks

Academic Year: (2020 / 2021) **Review date: 08-01-2016**

Department assigned to the subject:

Coordinating teacher: SERRANO YAÑEZ-MINGOT, PABLO

Type: Electives ECTS Credits : 3.0

Year : 1 Semester : 1

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

Basic (i.e., grad) knowledge of probability and statistics. Some previous knowledge about communication systems is also recommended, as they constitute the main cases of study.

OBJECTIVES

Fundamentals of Markov chain theory, and the ability to use the main results to model communication system.
Performance analysis and capacity planning of queues and networks of queues, ability to identify weakenesses, bottlenecks and congestion problems.
Performance analysis (reliability, goodput) of classic communication systems.

DESCRIPTION OF CONTENTS: PROGRAMME

Overview of probability.
Exponential random variable and Poisson arrival process
Discrete-time Markov chains.
Continuous-time Markov chains
Queueing theory.
Networks of queues.

LEARNING ACTIVITIES AND METHODOLOGY

The course consists on two types of lectures: 1. theoretical lectures, where the key results will be developed, and 2. practical lectures, where those principles will be used to solve the proposed problems.

ASSESSMENT SYSTEM

40% exercises before the final.
60% final.

% end-of-term-examination:	60
% of continuous assessment (assigments, laboratory, practicals…):	40

BASIC BIBLIOGRAPHY

- Mor Harchol-Balter Performance Modeling and Design of Computer Systems: Queueing Theory in Action, Cambridge University Press, 2013

ADDITIONAL BIBLIOGRAPHY

- José Alberto Hernández, Pablo Serrano Probabilistic models for computer networks: Tools and solved problems, Lulu Press, Inc, 2005