Course syllabus

Kösystem
Queuing System

EITG20, 5 credits, G2 (First Cycle)

Valid for: 2023/24
Faculty: Faculty of Engineering, LTH
Decided by: PLED C/D
Date of Decision: 2023-04-18

General Information

Main field: Technology.
Compulsory for: C3, D3
Elective for: E4-ks
Language of instruction: The course will be given in Swedish

Aim

The purpose of the course is to introduce methods to predict the real-time behaviour of service systems, especially for telecommunucation systems.

Learning outcomes

Knowledge and understanding
For a passing grade the student must

- Solve problems in elementary queuing theory and queuing network theory
- Use simple simulation tools

Competences and skills
For a passing grade the student must

- Use simple queuing models to estimate the real-time properties of a system
- Use discrete event simulation to study the performance of a system
- Be able to interpret measurements and make estimations

Judgement and approach
For a passing grade the student must

- Show ability to critically interpret resluts from calculations and simulations

- Show knowledge of limitations of mathemactical models of queuing systems

Contents

The course treats real-time properties of communication systems. The students learn to predict the performance of systems, which also gives the ability to improve and optimise systems.

The course contains an overview of elementary queuing and queuing network theory and also introduces discrete event simulation. In queuing theory methods to calculate the average time a customer spends in a queue and the blocking probability are treated. In queuing network theory Jackson networks are studied. Discrete event simulation using a general programming language is studied.

Examination details

Grading scale: TH - (U,3,4,5) - (Fail, Three, Four, Five)
Assessment: To pass, approved laboratory work and a passed exam are required. The final grade for the course is based on the results of the exam.

The examiner, in consultation with Disability Support Services, may deviate from the regular form of examination in order to provide a permanently disabled student with a form of examination equivalent to that of a student without a disability.

Parts
Code: 0123. **Name:** Exam.
Credits: 3. **Grading scale:** TH. **Assessment:** Approved exam **Contents:** Written exam
Code: 0223. **Name:** Laboratory Work.
Credits: 2. **Grading scale:** UG. **Assessment:** Approved laboratory work **Contents:** Laboratory work

Admission

Assumed prior knowledge: FMS012/FMSF45/FMSF55 Mathematical Statistics. Knowledge corresponding to ETS130/EITA55 Communication Systems or ETS052/EITA45 Computer Communication. Basic knowledge in programming.
The number of participants is limited to: No
The course overlaps following course/s: ETS075, ETS010, ETS020, ETS055

Reading list

- Körner, Ulf: "Köteori" (Course material in English will be provided).
- Exercise compendium.

Contact and other information

Course coordinator: Christian Nyberg, christian.nyberg@eit.lth.se
Course homepage: http://www.eit.lth.se/course/eitg20