GHENT UNIVERSITY

Course Specifications

Valid as from the academic year 2018-2019

Performance Analysis of Telecommunication Systems (E011610)

Course size (nominal values; actual values may depend on programme)

Credits	4.0	Study time	120 h
Contact hrs	30.0 h		

Course offerings and teaching methods in academic year 2018-2019

A (semester 1)	English	seminar	15.0 h
		lecture	15.0 h

Lecturers in academic year 2018-2019

Wittevrongel, Sabine	TW07	lecturer-in-charge

Offered in the following programmes in 2018-2019	crdts	offering
Bridging Programme Master of Science in Industrial Engineering and Operations Research	4	A
Bridging Programme Master of Science in Industrial Engineering and Operations Research	4	A
Master of Science in Electrical Engineering (main subject Communication and Information Technology)	4	A
Master of Science in Electrical Engineering (main subject Electronic Circuits and Systems)	4	A
Master of Science in Industrial Engineering and Operations Research	4	A
Master of Science in Computer Science Engineering	4	A
Master of Science in Computer Science Engineering	4	A
Master of Science in Industrial Engineering and Operations Research	4	A

Teaching languages

Dutch, English

Keywords

discrete-time queueing theory, performance evaluation

Position of the course

Introduction to elementary and more advanced queueing theoretic techniques in discrete time for the modelling, the performance evaluation, the dimensioning and the design of subsystems in nowadays integrated communication networks.

Contents

- Multiplexers and switching systems: buffer models in discrete time
- Elementary buffer analysis in discrete time: typical techniques
- Analysis of more complicated buffer models (with a more-dimensional state description): Correlated and bursty arrivals, Variable transmission times, Server interruptions, Priority systems

Initial competences

Elementary probability theory (see e.g. course 'Applied probability'); note that prior knowledge of continuous-time queueing theory (see e.g. course 'Queueing analysis and simulation) is absolutely not required

Final competences

1 To understand and to calculate performance measures of a buffer system.
2 To understand typical techniques for buffer analysis in discrete time and to apply them creatively.
3 To establish system equations for discrete-time buffer systems.
4 To have insight into the use of probability generating functions for the analysis of

discrete-time buffer systems
5 To analyse simple discrete-time buffer systems.
6 To understand the meaning of and to analyse more complicated discrete-time buffer models with a more-dimensional state description.
7 To have insight into results of buffer analysis and to understand the influence of model parameters on the buffer behavior.

Conditions for credit contract

Access to this course unit via a credit contract is determined after successful competences assessment

Conditions for exam contract

This course unit cannot be taken via an exam contract

Teaching methods

Lecture, seminar

Learning materials and price

Syllabus (about 5 euro); additional course material (available via Minerva)

References

- H. Bruneel, B.G. Kim, "Discrete-time models for communication systems including ATM" (Kluwer Academic Publishers, Boston, 1993)

Course content-related study coaching

By the lecturer and assistants: contacts are possible during or after the lectures and problem solving sessions, by means of email or after making an appointment

Evaluation methods

end-of-term evaluation

Examination methods in case of periodic evaluation during the first examination period

Open book examination

Examination methods in case of periodic evaluation during the second examination period

Open book examination

Examination methods in case of permanent evaluation

Possibilities of retake in case of permanent evaluation

not applicable

Extra information on the examination methods

Written open-book exam

Calculation of the examination mark