Introduction to Telecommunications (C003787)

Course Specifications

Valid in the academic year 2018-2019

Course

Course offerings and teaching methods in academic year 2018-2019

A (semester 1) Dutch seminar: coached exercises 30.0 h

Lecturers in academic year 2018-2019

Eeckhout, Lieven TW06 lecturer-in-charge

Offered in the following programmes in 2018-2019

- Bachelor of Science in Computer Science 6 A
- Preparatory Course Master of Science in Computer Science Engineering 6 A

Teaching languages

Dutch

Keywords

Telecommunication, signals, datacommunication, source and channel coding

Position of the course

The purpose of this introductory course is to provide knowledge and insight with respect to basic principles of telecommunication systems in general, and the operation and performance of coding techniques for (digital) communication more in particular.

Contents

- Introduction to communication system; analog and digital data, signals and transmission
- Signals: signals as functions; basic concepts: frequency, spectrum, bandwidth; Fourier transform; sampling theorem
- Source coding: source models; entropy; source coding theorem; rate-distortion theory; coding of discrete and continuous sources; lossless and lossy compression
- Channel coding: discrete channel models; channel capacity; linear block codes; cyclic codes; error detection and correction; error probability; Hamming distance; syndrome computation; soft versus hard decoding

Initial competences

Knowledge and experience regarding probability and statistics, as well as differentiation and integration.

Final competences

1. Explain source coding and rate-distortion theorem.
2. Ability to use algorithms for source and channel coding.
3. To carry out error detection and correction based on syndrome computation.
4. Understand and apply fundamental aspects of (digital) communication systems.
5. Understand and apply sampling theorem.
6. Understand and apply Fourier transform.

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

(C Approved)
Teaching methods
   Lecture, seminar: coached exercises

Learning materials and price
   Lecture notes and slides (available via Minerva)

References
      Salehi, Prentice Hall, 2002

Course content-related study coaching
   The lecturer(s) is/are available during contact hours, on appointment and via e-mail.

Evaluation methods
   end-of-term evaluation

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

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

Examination methods in case of permanent evaluation

Possibilities of retake in case of permanent evaluation
   examination during the second examination period is not possible

Extra information on the examination methods
   Periodical evaluation: written exam.

Calculation of the examination mark
   100% periodical evaluation.