GHENT UNIVERSITY

Course Specifications

Valid as from the academic year 2015-2016

Advanced Modulation and Coding (E012210)

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 2017-2018

A (semester 2)	lecture	15.0 h
	seminar: coached exercises	15.0 h

Lecturers in academic year 2017-2018

Steendam, Heidi	TW07	lecturer-in-charge
Moeneclaey, Marc	TW07	co-lecturer

Offered in the following programmes in 2017-2018	crdts	offering
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 Computer Science Engineering	4	A
Master of Science in Computer Science Engineering	4	A

Teaching languages

English

Keywords

modulation, coding, detection, estimation

Position of the course

This course deals with communication systems that make use of advanced modulation, coding, detection and estimation. A selection of the topics mentioned below will be covered

Contents

- Advanced coding: turbo codes; LDPC codes; Trellis-codes
- Advanced modulation and detection: Modulation and detection for systems with multiple antennas (MIMO)
- Iterative ("turbo") estimation and detection: decoding; equalization; synchronization

Initial competences

Communication Theory

Final competences

1 Recognize and use factor graphs.
2 Analyse and apply turbo codes, LDPC codes.
3 Evaluate systems with multiple antennas.
4 Apply turbo estimation.
5 Understand and use techniques to reduce the effect of interference.
6 Understand and use iterative techniques to reach theoretical performance bounds.

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: coached exercises

Learning materials and price

available on Minerva

References

H. Wymeersch, Iterative Receiver Design, Cambridge University Press, ISBN: 978-0521873154

Course content-related study coaching

Evaluation methods

end-of-term evaluation and continuous assessment

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

Oral examination

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

Oral examination

Examination methods in case of permanent evaluation

Oral examination, report

Possibilities of retake in case of permanent evaluation

examination during the second examination period is not possible

Extra information on the examination methods

During examination period: oral closed-book exam
During semester: graded project reports; graded oral presentation. Second chance: Not possible

Calculation of the examination mark

Evaluation throughout semester as well as during examination period. Special conditions: Evaluation throughout semester : 75% Examination : 25%