Course Specifications
Valid as from the academic year 2019-2020

Due to Covid 19, the education and evaluation methods may vary from the information displayed in the schedules and course details. Any changes will be communicated on Ufora.

Course offerings and teaching methods in academic year 2019-2020
A (semester 2)  English  UGent  on campus lecture  15.0 h
on campus seminar: coached exercises  15.0 h

Lecturers in academic year 2019-2020
Steendam, Heidi  TW07  lecturer-in-charge
Moeneclaey, Marc  TW07  co-lecturer

Offered in the following programmes in 2019-2020

<table>
<thead>
<tr>
<th>Programme</th>
<th>Credits</th>
<th>Offering</th>
</tr>
</thead>
<tbody>
<tr>
<td>Master of Science in Electrical Engineering</td>
<td>4</td>
<td>A</td>
</tr>
<tr>
<td>Communication and Information Technology</td>
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<tr>
<td>Master of Science in Electrical Engineering</td>
<td>4</td>
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<tr>
<td>(main subject) Communication and Information Technology</td>
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<tr>
<td>Master of Science in Electrical Engineering</td>
<td>4</td>
<td>A</td>
</tr>
<tr>
<td>(main subject) Electronic Circuits and Systems</td>
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<tr>
<td>Master of Science in Computer Science Engineering</td>
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<td>A</td>
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</tbody>
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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
- 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

(Approved)
Teaching methods
   On campus lecture, on campus seminar: coached exercises

Learning materials and price
   available on the electronic learning platform

References

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%

(Approved)