

## Mobile and Broadband Access Networks (E012320)

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

**Credits 6.0**

**Study time 180 h**

**Course offerings and teaching methods in academic year 2023-2024**

Offering	Language	Location	Teaching Methods	Hours
A (semester 2)	Dutch	Gent	practicum	12.5h
			guided self-study	30.0h
			seminar: coached exercises	5.0h
B (semester 2)	English	Gent	seminar: coached exercises	5.0h
			lecture	25.0h
			guided self-study	5.0h
			practicum	12.5h

**Lecturers in academic year 2023-2024**

Pickavet, Mario	TW05	lecturer-in-charge
Hoebeke, Jeroen	TW05	co-lecturer
Moerman, Ingrid	TW05	co-lecturer

**Offered in the following programmes in 2023-2024**

Programme	crdts	offering
<a href="#">Bridging Programme Master of Science in Electrical Engineering(main subject Communication and Information Technology )</a>	6	B
<a href="#">Bridging Programme Master of Science in Computer Science Engineering</a>	6	B
<a href="#">Master of Science in Electrical Engineering (main subject Communication and Information Technology )</a>	6	B
<a href="#">Master of Science in Electromechanical Engineering(main subject Control Engineering and Automation)</a>	6	B
<a href="#">Master of Science in Electromechanical Engineering(main subject Electrical Power Engineering)</a>	6	B
<a href="#">Master of Science in Electromechanical Engineering(main subject Maritime Engineering)</a>	6	B
<a href="#">Master of Science in Electromechanical Engineering(main subject Mechanical Construction)</a>	6	B
<a href="#">Master of Science in Electromechanical Engineering(main subject Mechanical Energy Engineering)</a>	6	B
<a href="#">Master of Science in Computer Science Engineering</a>	6	A
<a href="#">Master of Science in Computer Science Engineering</a>	6	B
<a href="#">Master of Science in Information Engineering Technology</a>	6	B
<a href="#">Exchange Programme Information Engineering Technology</a>	6	B

**Teaching languages**

English, Dutch

**Keywords**

Mobile and wireless communication networks, broadband access networks, network modeling techniques

**Position of the course**

- Concepts and technology of wireless and wired access communication networks
- Network modeling algorithms and calculations

**Contents**

- Wireless transmission and Medium Access Control (MAC)

- Basic network modeling techniques
- Wireless ad hoc network design issues (clustering, flooding, routing, robustness)
- Cellular networks: GSM, UMTS, LTE and next evolutions
- Design and dimensioning of cellular networks
- Mobile network layer
- Broadband access networks (e.g. fiber)
- Design and dimensioning of broadband access networks

### Initial competences

communication networks, basic knowledge graph theory

### Final competences

- 1 to analyse theoretical concepts in order to explain the operation and limitations of wireless and wired access networks
- 2 to gain insight in network modeling algorithms and their applications/limitations
- 3 to apply these techniques for routing and design problems in access networks
- 4 to analyse the behavior of mobile and wireless networks through network simulations
- 5 to design network protocols for mobile and wireless networks and to optimize protocol parameters
- 6 to analyse and evaluate access networks and mobile networks in terms of performance and usability for diverse applications

### 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

### Extra information on the teaching methods

Group work; Classroom lectures; Lab sessions; Classroom problem solving sessions; Theoretical classroom; Guided self study; online discussion group

### Learning materials and price

Handouts + notes of lectures (made available on the electronic learning platform, printed copies of handouts via VTK)

### References

- "Mobile Communications, second edition", Jochen Schiller, Pearson Education Limited, 2003, ISBN-10: 0321123816, ISBN-13: 978-0321123817
- "Mobile Radio Networks : Networking, Protocols and Traffic Performance", Bernhard H. Walke, J. Wiley & Sons, Second Edition, 2002, ISBN\_0471\_49902 1

### Course content-related study coaching

### Assessment moments

end-of-term and continuous assessment

### Examination methods in case of periodic assessment during the first examination period

Written assessment open-book

### Examination methods in case of periodic assessment during the second examination period

Written assessment open-book

### Examination methods in case of permanent assessment

Skills test, Participation

### Possibilities of retake in case of permanent assessment

examination during the second examination period is not possible

### Extra information on the examination methods

#### During examination period:

- Written assessment open-book
- Second chance: possible

#### During semester:

- graded lab sessions
- second chance: not possible

- frequency: 4 practical sessions

#### **Calculation of the examination mark**

Evaluation throughout semester as well as during examination period

##### **Special conditions:**

- Evaluation throughout semester: 20% of the points
- Evaluation during examination period: 80% of the points
- Second chance for evaluation throughout the semester is not possible. Points for evaluation throughout semester are transferred in case of second chance.