GHENT UNIVERSITY

Course Specifications

Valid in the academic year 2023-2024

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

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	TWO5	lecturer-in-charge
Hoebeke, Jeroen	TWO5	co-lecturer
Moerman, Ingrid	TWO5	co-lecturer

Offered in the following programmes in 2023-2024	crdts	offering
Bridging Programme Master of Science in Electrical Engineering(main subject Communication and Information Technology)	6	B
Bridging Programme Master of Science in Computer Science Engineering	6	B
Master of Science in Electrical Engineering (main subject Communication and Information Technology)	6	B
Master of Science in Electromechanical Engineering(main subject Control Engineering and Automation)	6	B
Master of Science in Electromechanical Engineering(main subject Electrical Power Engineering)	6	B
Master of Science in Electromechanical Engineering(main subject Maritime Engineering)	6	B
Master of Science in Electromechanical Engineering(main subject Mechanical Construction)	6	B
Master of Science in Electromechanical Engineering(main subject Mechanical Energy Engineering)	6	B
Master of Science in Computer Science Engineering	6	A
Master of Science in Computer Science Engineering	6	B
Master of Science in Information Engineering Technology	6	B
Exchange Programme Information Engineering Technology	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 transfered in case of second chance.