

Advanced Databases (E018441)

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

Credits 6.0 **Study time** 180 h **Contact hrs** 60.0 h

Course offerings and teaching methods in academic year 2021-2022

A (semester 1)	Dutch	Gent	online seminar	30.0 h
			online lecture	30.0 h

Lecturers in academic year 2021-2022

Bronselaer, Antoon	TW07	lecturer-in-charge
De Tré, Guy	TW07	co-lecturer

Offered in the following programmes in 2021-2022

	crdts	offering
Master of Science in Business Engineering (main subject Data Analytics)	6	A
Master of Science in Business Engineering (main subject Operations Management)	6	A
Master of Science in Geomatics and Surveying	6	A
Master of Science in Computer Science	6	A
Master of Science in Information Engineering Technology	6	A
Master of Science in Computer Science Engineering	6	A
Master of Science in Computer Science Engineering	6	A

Teaching languages

Dutch

Keywords

data quality, data warehousing, NoSQL, imputation, normalisation, indexing

Position of the course

This course is a specialization course in which theory and applications on databases are learned. A first part of the course deals with methods for measurement and improvement of data quality. Several algorithms for detection of errors are discussed. Also methods for systematic correction of these errors are discussed. Finally, the part on data quality also deals with database normal forms and their practical use. In a second part, non-relational database models are introduced (NoSQL) and we learn about the concept of data warehousing. Finally, we also study elementary storage of data and faster querying of data (indexing).

Contents

- Data quality: basic measurement
- Edit rules
- Functional dependencies and normal forms
- Repair of systematic and random errors
- Dynamic analysis of data quality
- Data deduplication
- Control digits
- Data warehousing: Concepts and techniques
- Primary and secondary file organization
- NoSQL solutions and distributed databases for management of Big data

Initial competences

basic principles of (relational) databases

Final competences

- 1 Understanding basic techniques for measurement of data quality.
- 2 Understanding basic techniques for improvement of data quality.
- 3 Understand the basic principles of physical database storage and indexing.
- 4 Being able to apply datawarehouse technology.
- 5 Knowing how 'Big' data can be managed via NoSQL and distributed database technology.

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

Online lecture, online seminar

Extra information on the teaching methods

Because of COVID19, changed working methods can be rolled out if this proves necessary.

Learning materials and price

- Syllabus (In English). Additional course material is available through the electronic learning environment Ufora
- Basic price: 20 EURO

References

- R. Elmasri, S.B. Navathe, Fundamentals of Database Systems, Seventh Edition, Pearson Addison-Wesley, Boston USA, 2016 (ISBN: 9780133971330)
- T. de Waal, J. Pannekoek, S. Scholtus, Handbook of Statistical Data Editing and Imputation, Wiley, 2011 (ISBN: 978-0-470-54280-4)
- G. De Tré, Principes van databases, 2e editie. Pearson Education Benelux, 2017 (ISBN: 978-90-430-3580-4)

Course content-related study coaching

All exercise courses and the practicum are supported by assistants.

Evaluation methods

end-of-term evaluation and continuous assessment

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

Written examination, open book examination

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

Written examination, open book examination

Examination methods in case of permanent evaluation

Report

Possibilities of retake in case of permanent evaluation

examination during the second examination period is possible in modified form

Extra information on the examination methods

During examination period: Written open-book exam. If an "on campus" exam is not possible, exams will be organised via MS Teams.

Outside examination period: Report

Calculation of the examination mark

Weighted average of both evaluations with the following weight:

- Periodic evaluation: 13/20

- Non-periodic evaluation: 7/20

Special condition: students must pass for both parts of the evaluation in order to pass for the course

Partial exemption for non-periodic evaluation is possible