GHENT UNIVERSITY

Course Specifications

Valid as from the academic year 2025-2026

Databases (C003803)

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

Credits 5.0 **Study time 150 h**

Course offerings and teaching methods in academic year 2025-2026

A (semester 2)	English	Gent	independent work
			seminar
			lecture

Lecturers in academic year 2025-2026

Bronselaer, Antoon	TW07	lecturer-in-charge

Offered in the following programmes in 2025-2026	**crdts**	**offering**
Master of Science in Statistical Data Analysis	5	A

Teaching languages

English

Keywords

Relational databases, SQL, Graph databases, Data warehouses, Data quality

Position of the course

The global objective of this course is to provide students with theoretical knowledge as well as practical usage of database technology. The main emphasis is on usage of existing databases (interpreting and reading schemas, retrieving data in an efficient manner, verifying quality of data...).

Contents

1 Relational databases: the relational model, constraints, relational algebra, the SQL query language, use of indices and query optimization
2 NoSQL databases: Document stores, Key-Value stores, Graph databases, property graph models, the Cypher query language
3 Data warehousing: dimensional models, ETL processes
4 Data Quality: measurement of data quality, edit rules in the Fellegi-Holt framework, the error localization problem, minimal set covers, branch-and-bound solutions

Initial competences

Basic knowledge of programming

Final competences

1 Understanding the relational model for databases and being able to use a relational database
2 Understanding the basics of NoSQL databases in general and being able to use a graph database
3 Understanding the basics of data warehouse models as an analytical tool
4 Understanding the basics of data quality measurement and being able to apply edit rules in practice

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

Seminar, Lecture, Independent work

Extra information on the teaching methods

SQL exercises will be done via the platform dodona, which allows (almost) self-training of the SQL query language.

Study material

Type: Slides

Name: Slides
Indicative price: € 25
Optional: no
Language : English
Number of Slides : 500
Available on Ufora : Yes
Online Available : No
Available in the Library : No
Available through Student Association : No

References

- S. Abiteboul, R. Hull, V. Vianu, Foundations of databases, Addison Wesley, 1995
- T. De Waal, J. Pannekoek, S. Scholtus, Handbook of Statistical Data Editing and Imputation, Wiley, 2011
- R. Kimball, M. Ross, The Data Warehouse Toolkit (3rd edition), 2013

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

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

Written assessment

Examination methods in case of permanent assessment

Assignment

Possibilities of retake in case of permanent assessment

examination during the second examination period is possible

Calculation of the examination mark

The periodic and non-periodic evaluation will each account for 50% of the total score.
Students can only pass this course if they obtain a minimum score of 10/20 for both parts of the evaluation. If students obtain less than 10/20 for at least one of the parts, the following rules apply:

- If one obtains an 8/20 or 9/20 for at least one part of the evaluation, one cannot pass the whole of the course. If the final score computed with the weighted average is 10/20 or higher, this will be reduced to the highest unsuccessful mark, which is 9/20.
- If one obtains less than 8/20 for at least one part of the evaluation, one cannot pass the course. If the final score computed with the weighted average is 8/20 or higher, this will be reduced to the highest non-deliberable mark, which is 7/20.

Partial exemption for the non-periodic evaluation is possible.

Facilities for Working Students

- SQL can be exercised via the online learning platform dodona