



Course and Examination Fact Sheet: Autumn Semester 2023

7,264: Data Handling: Databases

ECTS credits: 4

Overview examination/s

(binding regulations see below)

decentral - Written work, Digital, Individual work individual grade (80%)

Examination time: Term time

decentral - Active participation, Analog, Individual work individual grade (20%)

Examination time: Term time

Attached courses

Timetable -- Language -- Lecturer

[7,264,1.00 Data Handling: Databases](#) -- English -- [Venturini Marco](#)

Course information

Course prerequisites

- **Mathematics:** algebra, discrete mathematics, statistics
- **Computer Science:** elementary programming skills

Learning objectives

After completion of the course, students will have acquired the skills to use database systems in order to manage and process large data sets. These include knowledge about conceptual data modelling using the Entity-Relationship model as well as creating, manipulating, and querying databases using SQL. Students will also have a basic understanding of the internal operation of such systems in terms of query optimization and transaction management.

Course content

The course will provide a basic overview of the functionality, architecture, and implementation of database systems as a foundation for computer-based information systems. A database system is a general-purpose platform to manage and process data. Information is represented, stored, and managed according to a data model, while it is queried (retrieved) and manipulated using a special-purpose language.

The course is organized around three main parts, which follow the steps that are typically required to design, use and maintain a database. The first part is dedicated to data modelling. Conceptual database design is introduced based on the Entity-Relationship (ER) model, whereas logical database design is studied in the context of the relational model of data and its normal forms. The second part is dedicated to database languages. After presenting the relational algebra as a formal foundation, the course will provide a thorough introduction into SQL, which is currently the most widely- used and most important database language. The third and final part of the course is dedicated to the benefits that arise for database users due to the platform-based approach. In this part, the course will give a brief overview of the internal structures and functioning of a database system, such as concurrency control, indexing, and query processing.

In addition to the theoretical concepts, the course will feature in-class exercises and a practical project that will enable students to apply the new knowledge by going through the process of setting up and querying their own database. These practical assignments will be based on the open-source database management system PostgreSQL, which students will install on their own computers as it is available for many operating systems and platforms.

Course structure and indications of the learning and teaching design



The course is structured as a block course on three full days.

The contents of the course are taught in classical lecture style. Students can ask questions anytime. To engage students they are encouraged to solve smaller problems during the lectures. For every part of the course, there is a larger in-class exercise. Solutions to both smaller and larger problems will be discussed in the lectures.

Course literature

- Alfons Kemper und André Eickler: Datenbanksysteme: Eine Einführung (9. Auflage), 2013
- Raghu Ramakrishnan and Johannes Gehrke: Database Management Systems (3rd Edition), McGraw-Hill, 2002

Additional course information

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Examination information

Examination sub part/s

1. Examination sub part (1/2)

Examination modalities

Examination type	Written work
Responsible for organisation	decentral
Examination form	Written work
Examination mode	Digital
Time of examination	Term time
Examination execution	Asynchronous
Examination location	Off Campus
Grading type	Individual work individual grade
Weighting	80%
Duration	--

Examination languages

Question language: English

Answer language: English

Remark

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Examination-aid rule

Free aids provision

Basically, students are free to choose aids. Any restrictions are defined by the faculty members in charge of the examination under supplementary aids.

Supplementary aids

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2. Examination sub part (2/2)

Examination modalities

Examination type	Active participation
Responsible for organisation	decentral



Examination form	Oral examination
Examination mode	Analog
Time of examination	Term time
Examination execution	Synchronous
Examination location	On Campus
Grading type	Individual work individual grade
Weighting	20%
Duration	--

Examination languages

Question language: English

Answer language: English

Remark

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Examination-aid rule

Free aids provision

Basically, students are free to choose aids. Any restrictions are defined by the faculty members in charge of the examination under supplementary aids.

Supplementary aids

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Examination content

The take-home exam will take the form of a database development project that students complete individually. Students will need to design and setup their own database in PostgreSQL. This database will then serve as the basis for the various SQL programming tasks that they will be asked to complete. As a consequence, the take-home exam covers all parts of the course.

Examination relevant literature

The slides used in the course are the mandatory basis for the examination.

Additionally, the following books provide supplementary reference.

- Alfons Kemper und André Eickler: Datenbanksysteme: Eine Einführung (9. Auflage), 2013
- Raghu Ramakrishnan and Johannes Gehrke: Database Management Systems (3rd Edition), McGraw-Hill, 2002



Please note

Please note that only this fact sheet and the examination schedule published at the time of bidding are binding and takes precedence over other information, such as information on StudyNet (Canvas), on lecturers' websites and information in lectures etc.

Any references and links to third-party content within the fact sheet are only of a supplementary, informative nature and lie outside the area of responsibility of the University of St.Gallen.

Documents and materials are only relevant for central examinations if they are available by the end of the lecture period (CW51) at the latest. In the case of centrally organised mid-term examinations, the documents and materials up to CW 42 are relevant for testing.

Binding nature of the fact sheets:

- Course information as well as examination date (organised centrally/decentrally) and form of examination: from bidding start in CW 34 (Thursday, 24 August 2023);
- Examination information (supplementary aids, examination contents, examination literature) for decentralised examinations: in CW 42 (Monday, 16 October 2023);
- Examination information (supplementary aids, examination contents, examination literature) for centrally organised mid-term examinations: in CW 45 (Monday, 06 November 2023);
- Examination information (regulations on aids, examination contents, examination literature) for centrally organised examinations: two weeks before the end of the de-registration period in CW 45 (Monday, 06 November 2023).