Linnæus University

Dnr: LNU-2026/747

Course syllabus

Faculty of Technology
Department of Computer Science and Media Technology

4DT909 Informationsvisualisering, 5 högskolepoäng
Information Visualization, 5 credits

Main field of study
Computer Engineering

Subject
Informatics/Computer and Systems Sciences

Level
Second cycle

Progression
A1N

Date of Ratification
Approved 2024-01-15.
Revised 2026-03-02.
The course syllabus is valid from autumn semester 2026.

Prerequisites
90 credits in Computer Science (including a degree project at Bachelor level).
English 6 or the equivalent.

Objectives

After completing the course the student shall be able to:
Knowledge and understanding

- A.1 Classify typical user tasks for visualizations,
- A.2 define and explain the visualization techniques (regarding interaction and visual representation) and example tools discussed in the course, and
- A.3 recall and explain the fundamental perceptual principles that have influence on information visualization.

Skills and abilities

- B.1 Represent data by expressive and effective visualizations using state-of-the-art methods, software, and tools.

Judgement and approach

- C.1 Critically reflect on visualization and interaction approaches in the light of current theories and research, and
- C.2 make well-grounded design choices in the context of various tasks and data constraints.

Content

Information visualization centers on abstract information that does not have a physical or geometric correspondence to the real world. Examples of such abstract data are symbolic, tabular, networked, hierarchical, or textual information sources. The course provides an overview of the most common information visualization techniques and their application. The following topics are covered:

- Definition of the field of information visualization and relationships to related fields such as human-computer interaction or scientific visualization
- Basics in visual perception (preattentive processing, Gestalt laws) and cognition
- Data and visualization foundations and processing
- Task abstractions and taxonomies
- Interaction concepts and techniques (e.g., dynamic queries, zoom and pan, or focus and context)
- Visualization techniques for 1D, 2D, 3D, and multidimensional data
- Overview of current systems and toolkits for information visualization

Type of Instruction

The instruction consists of lectures, seminars, and teacher-supervised laboratory sessions.

Examination

The course is assessed with the grades A, B, C, D, E or F.

The grade A constitutes the highest grade on the scale and the remaining grades follow in descending order where the grade E is the lowest grade on the scale that will result in a pass. The grade F means that the student’s performance is assessed as fail (i.e. received the grade F).

Assessment of student performance is made through assignments and written exam. Resit examination is offered in accordance with Linnaeus University’s Local regulations for courses and examination at the first- and second-cycle levels.

The assignments will be judged based on the quality of the submissions and according to the defined scope. The assignments may be developed in groups, but the examination of assignments is based on the students individual performance as well as the performance within the project team. The assignments are examined through submission, followed by subsequent oral examinations. Submitting the assignments but not participating in the oral examination of the assignments will result in failure (grade F).

To pass the course, grade E or higher is required for all parts. The final grade is decided from: Assignments (40%) and individual written exam (60%).

In the event that a student with a disability is entitled to special study support, the examiner will decide on adapted or alternative examination arrangements.

Objectives achievement

The examination of the course is divided as follows:
Module 2601 Assignments 2.0 credits with the grading system AF
Module 2602 Written exam 3.0 credits with the grading system AF

The examination elements are linked to the course objectives in the following ways:
Module 2601 links to the course objectives: A.1, A.2, A.3, B.1, C.1, C.2
Module 2602 links to the course objectives: A.1, A.2, A.3, C.1, C.2

Course Evaluation

A course evaluation should be conducted during the course or in connection with its conclusion. The results and analysis of the completed course evaluation should be promptly communicated to students who have completed the course. Students participating in the next course instance should be informed of the results of the previous course evaluation and any improvements that have been made, no later than at the start of the course.

Overlap

The course cannot be included in a degree along with the following course/courses of which the content fully, or partly, corresponds to the content of this course:
4DV805, 5 credits

Other Information

Grade criteria for the A-F scale are communicated to the student through a special document. The student is to be informed about the grade criteria for the course by the start of the course at the latest. The course is conducted in such a way that the course participants' experiences and knowledge are made visible and developed. This means, for example, that we have an inclusive approach and strive for no one to feel excluded. This can be expressed in different ways in a course, for example by using the gender neutral example.

Required Reading and Additional Study Material

Required reading:

- Spence, Robert, *Information Visualization – An Introduction*, Springer, latest edition. Pages: 200 of 292.
- Munzner, Tamara, *Visualization Analysis and Design*, CRC Press, latest edition. Pages: 150 of 404.
- Ware, Colin, *Information Visualization: Perception for Design*, Morgan Kaufmann, latest edition. Pages: 100 of 512.
- Material provided by the department.