Linnæus University

Course syllabus

Faculty of Technology
Department of Computer Science and Media Technology

4DV805 Informationsvisualisering, 5 högskolepoäng
Information Visualization, 5 credits

Main field of study
Computer Science

Subject Group
Informatics/Computer and Systems Sciences

Level of classification
Second Level

Progression
A1N

Date of Ratification
Approved by Faculty of Technology 2019-10-28
The course syllabus is valid from autumn semester 2020

Prerequisites

- 90 credits in Computer Science (including a degree project at Bachelor level).
- English B/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 examination of the course is divided as following:

Code	Appellation	Grade	Credits
2001	Assignment	AF	3.00
2002	Oral exam	AF	2.00

The course is assessed with the grades A, B, C, D, E, Fx 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 an oral exam. Repeat examination is offered in accordance with Local regulations for courses and examination at the first- and second-cycle level at Linnaeus University.

To pass the course, grade E or higher is required for all parts. The final grade is decided from: Assignments (60%) and Oral exam (40%).
If the university has decided that a student is entitled to special pedagogical support due to a disability, the examiner has the right to give a customized exam or to have the student conduct the exam in an alternative way.

Objectives achievement

The examination parts are linked to the learning outcomes as follows:

Goal	2001	2002
A.1	✓	✓
A.2	✓	✓
A.3	✓	✓
B.1	✓	

| C.1 | ✓ | ✓ |
| C.2 | ✓ | ✓ |

Course Evaluation
During the implementation of the course or in close conjunction with the course, a course evaluation is to be carried out. Results and analysis of the course evaluation are to be promptly presented as feedback to the students who have completed the course. Students who participate during the next course instance receive feedback at the start of the course. The course evaluation is to be carried out anonymously.

Credit Overlap
The course cannot be included in a degree along with the following courses of which the content fully, or partly, corresponds to the content of this course: 4DV800 5 credits

Other
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.
- Compendium of scientific articles.