

## Data Visualization (C004041)

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

**Credits 3.0** **Study time 90 h**

**Course offerings and teaching methods in academic year 2025-2026**

A (semester 2) Dutch Gent lecture

**Lecturers in academic year 2025-2026**

Mesuer, Bart WE02 lecturer-in-charge

**Offered in the following programmes in 2025-2026**

	crdts	offering
<a href="#">Master of Science in Teaching in Science and Technology(main subject Computer Science)</a>	3	A
<a href="#">Master of Science in Teaching in Science and Technology(main subject Mathematics)</a>	3	A
<a href="#">Master of Science in Computer Science</a>	3	A
<a href="#">Master of Science in Mathematics</a>	3	A

**Teaching languages**

Dutch

**Keywords**

data, data visualization, data analysis

**Position of the course**

**Contents**

Introduction

- Why data visualization
- Historical perspective
- Principles of data visualization
  - Perceiving, Interpreting, Comprehending
  - Trustworthy, accessible, elegant

Data

- Working with data
- Recognizing and naming the different data types

Visual encoding of data

- Representing data using marks and properties
- Knowing when to use which property
- The use of color: saturation, hue and luminance

Chart fundamentals

- An overview of 50+ existing graph types to represent categorical, hierarchical, relational, temporal and spatial data

Technical skills

- Introduction to Observable notebooks
- Introduction to Vega Lite and the Grammar of Graphics
- Introduction to D3.js

Assignments and project

- Discussing existing visualisations and finding ways to improve them
- Creating a complete visualisation project from raw data to a finalized end result

**Initial competences**

Students are expected to be able to program in a *high-level* programming language such as Java, JavaScript, Python, ...

**Final competences**

- 1 Use standard APIs and tools to create visual displays of data, including graphs, charts, tables, and histograms.
- 2 Have familiarity with several approaches to using a computer as a means for interacting with and processing data.
- 3 Extract useful information from a dataset.
- 4 Analyze and select visualization techniques for specific problems.
- 5 Describe issues related to scaling data analysis from small to large data sets.
- 6 Describe the tradeoffs of visualization algorithms in terms of accuracy and performance.
- 7 Propose a suitable visualization design for a particular combination of data characteristics and application tasks.
- 8 Analyze the effectiveness of a given visualization for a particular task.

#### **Conditions for credit contract**

Access to this course unit via a credit contract is determined after successful competences assessment

#### **Conditions for exam contract**

Access to this course unit via an exam contract is unrestricted

#### **Teaching methods**

Lecture

#### **Extra information on the teaching methods**

Interactive lectures consisting of theory, analyzing and discussing examples, and discussing the case studies made by the students as home work.

#### **Study material**

Type: Handbook

Name: Data Visualisation - A handbook for data driven design (Andy Kirk)

Indicative price: € 30

Optional: yes

Language : English

Author : Andy Kirk

Type: Slides

Name: Slides

Indicative price: Free or paid by faculty

Optional: no

#### **References**

Optional books:

- Data Visualisation - A handbook for data driven design (Andy Kirk)
- Interactive Data Visualization for the Web (Scott Murray)

#### **Course content-related study coaching**

#### **Assessment moments**

continuous assessment

#### **Examination methods in case of periodic assessment during the first examination period**

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

#### **Examination methods in case of permanent assessment**

Assignment

#### **Possibilities of retake in case of permanent assessment**

examination during the second examination period is possible in modified form

#### **Extra information on the examination methods**

Students will be evaluated by reporting about a number of case studies they analyzed as home work assignment. Additionally, they will work on a project in team.

#### **Calculation of the examination mark**

100% permanent evaluation

If the student does not pass in the first examination period, a new assignment will be provided for the second examination period.

## **Facilities for Working Students**

Mogelijkheid tot vrijstelling van aanwezigheid met vervangende opdracht na overleg met verantwoordelijke lesgever