Course: Data Science 3 — credits: 5

Course code	BFVM23DATASCNC3
Name	Data Science 3
Study year	2025-2026
ECTS credits	5
Language	English
Coordinator	-
Modes of delivery	Lecture Tutorial
Assessments	Linear Algebra - Written, organised by STAD examinations Signal Analysis - Computer, organised by STAD examinations

Learning outcomes

- You manipulate mathematical expressions involving real and complex numbers, scalars, vectors and matrices.
- You invert and decompose matrices, manually or assisted by computer, and diagnose and solve rank-deficient or ill-conditioned problems.
- You process time-series data, including resampling, interpolation, and curve fitting by linear regression.
- You apply linear filters and other data transformations in both the time- and frequency domains.

Content

This course introduces the fundamental concepts and techniques of linear algebra and their applications in solving problems in different areas. The course comprises an introduction to complex numbers, vectors and matrices and how to operate on these. It includes topics such as matrix determinants and trace, matrix inversion and decomposition, and characterization of matrix rank.
In parallel, the course covers signal analysis. Topics covered in this section include interpolation and curve fitting, windowing, filtering and convolution, Fourier transformation, and the design of elementary discrete filters. Overall students learn to analyze and manipulate a wide range of time series data to identify patterns, remove noise and artifacts, and enhance signals.

Included in programme(s)

Master Data Sciences for the Life Science

School(s)

Institute for Life Science & Technology

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