

Subject-specific competencies:

Systems of differential equations:

- The students can solve coupled linear differential equations in the time and frequency domain.
- They can analyze system stability of linear systems.

Statistics and probability calculus:

- The students have basic knowledge in the field of probability calculus.
- They know some important discrete and continuous distribution functions, their parameters and their typical areas of application.
- They can analyze bivariate random variables.
- They can characterize data sets using the most important terms of descriptive statistics.

Methodological competencies:

- The students can recognize and use connections between different areas of mathematics.
- They can identify which stochastic model resp. which distribution function to use for an application problem.

Teaching content:

Systems of differential equations:

- solution using eigenvalues and eigenvectors
- solution using matrix exponential
- solution using Laplace transform
- analysis of stability using eigenvalues

Statistics and probability calculus:

- basics of probability calculus (including conditional probability, independence)
- discrete and continuous distribution functions and their parameters
- covariance and correlation
- parameters for data sets: histograms, location and dispersion parameters, boxplot