2.2.1 Mathematics 2

Mathematics 2

Module Summary
Module code: EEIB210
Module coordinator: Prof. Dr. Thomas Westermann
Credits (ECTS): 7 Points
Semester: 2. Semester
Pre-requisites with regard to content: Mathematics I
Pre-requisites according to the examination regulations: Regarding to the examination regulations no pre-requisites are required
Competencies: The participants can understand and interpret mathematically formulated issues. They can apply the concepts taught to unknown tasks by • recognizing and solving eigenvalue problems • determining and interpreting mapping matrices, null spaces, and image spaces of linear mappings • applying matrix or determinant rules to solve systems of linear equations • explaining the concept of integration and solve unknown integrals, as well as solving type integrals using the product rule or the substitution rule • explaining the concept of improper integrals and calculate them • explaining number series and function series and applying convergence rules • calculating and interpreting Taylor and Fourier series of given functions. • recognizing various first-order differential equations and solving them reliably using the methods presented to be able to apply the mathematical tools in engineering subjects and in practice.
Assessment: Exam, 120 minutes
Usability: Provide mathematical methods for use in e.g. Electromagnetic Fields, Signals and Systems.

Course: Higher Mathematics 2
Module code: EITB211
Lecturer: Prof. Dr. Stefan Ritter, Prof. Dr. Thomas Westermann
Scope of weekly semester hours (SWS): 6
Semester of delivery: Summer semester
Type/mode: Lecture, Compulsory subject
Language of instruction: English

Content:

- Matrices
- Linear mappings
- Eigenvalue problems
- Integral calculus
- Improper integrals
- Series
- Taylor series
- Fourier series
- First order differential equations

Recommended reading:

- Westermann, T: Mathematics for Engineers (Part 2), iMath 2021, 1st Edition
- Problems: iMath-Problems App, Apple App Store/Android PlayStore
- www.home.hs-karlsruhe.de/~weth0002
- Goebbels, S. und Ritter, S.: Mathematik verstehen und anwenden, Springer-Spektrum 2013, 2. Auflage
- Westermann, T: Mathematik für Ingenieure, Springer 2020, 8. Auflage