Welcome to Mathematics!

Business Foundations Mathematics

Module Objectives

The module provides the essential mathematics competencies required for business studies. Covering topics from basic arithmetic and algebra to advanced calculus, probability, and financial mathematics, the course systematically builds mathematical literacy. Students develop computational skills, conceptual understanding, and the ability to apply mathematics to real-world business problems.

Upon completion, students will be able to:

- Master mathematical language and notation
- Solve algebraic equations and inequalities
- Analyze and interpret functions and their properties
- Apply differential and integral calculus to business applications
- Use probability theory for risk assessment and decision-making
- Apply financial mathematics to investment and loan problems
- Develop logical reasoning and proof skills
- Successfully pass the Feststellungsprüfung and begin their Bachelor's program

Note: Independent self-study is essential to achieve these objectives.

Assessment & Grading

This self-directed preparation module supports students in passing the mathematics component of the Feststellungsprüfung (assessment test) of a W-Course at Studienkolleg Hamburg. Students must maintain a minimum 75% attendance, which will be tracked, and actively participate in problem-solving sessions throughout the course. Success depends on motivation, independent learning, and consistent practice outside class.

The course has no formal grading by KLU. Instead, progress is monitored through homework, quizzes, tests, and presentations designed to track learning development. Lecturers provide guidance and support, but ultimately, responsibility for mastering the material and passing the Feststellungsprüfung rests with each student.

Why is this Module important aside from passing the Exam?

The value you get while learning mathematics are not mathematical concepts, definitions, theorems and proofs, but the lifetime and transferable skills that you can apply in every area of your life:

- Problem-solving skills
- Analytical thinking

- Logical reasoning
- Critical thinking
- Abstract thinking
- Pattern recognition
- Financial literacy

These fundamental cognitive abilities transcend mathematical applications and become invaluable assets in professional decision-making, strategic planning, and everyday problem-solving scenarios.

Module Structure

You can find the structure of the module in the Syllabus.

Keys to Success

- Practice regularly: Mathematics improves with daily problem-solving
- Participate actively: Ask questions and collaborate
- Form study groups: Learn collectively with peers
- Use practice tests: Simulate exam conditions
- Monitor your progress: Identify weak points early and address them

Important: Proficiency across all modules is required to pass the Feststellungsprüfung. Class time includes practice workshops and individual support.

How to see the slides

- This course is based on Quarto
- It uses revealjs to render the slides
- You find the slides for each part of the course in the corresponding section
- To see the slides, click on `RevealJS` in the top right side

AI Policy

Level 1: Pause – Use of AI defined by the educator

A course chatbot is available on the learning website for exploratory study. It is designed to guide your problem-solving process rather than provide answers directly. Use it as a learning tool, not a solution generator.

You may also use external AI tools (e.g., ChatGPT, Claude, Mistral, Gemini). However:

1. The Feststellungsprüfung does not allow AI usage.
2. Relying on AI to solve tasks for you weakens your preparation.
3. AI should support understanding — not replace practice.

Note, that large language model (LLM) are generally not very good in providing explicit solutions to mathematical tasks. They are better suited to explain concepts then step-by-step solutions. This is due to the nature of LLMs being pattern-based rather than rule-based.

Questions

If you have any questions regarding the course, please contact Tobias Vlćek under tobias.vlcek@uni-hamburg.de or Nikolai Heinrichs under nikolai.heinrichs@planningio.com

Bibliography