Valid from 2024.HS

Module description: Mathematics 1

Module Code	w.BA.XX.2Mathe1.XX
ECTS Credits	3
Language of Instruction/Examination	German
Module Description	Students know, understand, and are able to use the basic mathematical instruments of analysis in subject areas like sequences and series, financial mathematics, functions, and differential calculus. They are able to apply these instruments in formalizing, modeling, and solving quantitative problems of business administration and economics.
Organizational Unit	IRI Ltg.
Module Coordinator	Andreas Haldimann
Deputy Module Coordinator	Wolfgang Sickinger
Program and Specialization	• Business Administration - Specialization in Accounting, Controlling, Auditing • Business Administration - Specialization in Banking and Finance • Business Administration - Specialization in Behavioral Design • Business Administration - Specialization in Economics and Politics • Business Administration - Specialization in Financial Management • Business Administration - Specialization in General Management • Business Administration - Specialization in Marketing • Business Administration - Specialization in Risk and Insurance • Politics and Management
Legal Framework	Academic Regulations BSc dated 29.01.2009, for the degree programs in Business Administration, International Management, Business Information Technology, Business Law, Business Law and Applied Law, first adopted on 12.05.2009
Module Category	**Module Type** Compulsory **Program Phase** First Year-Studies
Prerequisite Knowledge	Mathematical knowledge at the level of the commercial vocational baccalaureate
Contribution to Program Learning Objectives (by the concerned Module)	• Professional Competence • Methodological Competence • Social Competence • Self-Competence
Contribution to Program Learning Objectives	**Professional Competence** • Knowing and Understanding Content of Theoretical and Practical Relevance • Apply, Analyze, and Synthesize Content of Theoretical and Practical Relevance • Evaluate Content of Theoretical and Practical Relevance **Methodological Competence** • Problem-Solving & Critical Thinking • Scientific Methodology • Work Methods, Techniques, and Procedures • Information Literacy • Creativity & Innovation **Social Competence** • Written Communication • Oral Communication • Teamwork & Conflict Management **Self-Competence** • Self-Management & Self-Reflection • Learning & Change

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Module Learning Objectives

Students...
- Use various set notations and identify which is most appropriate in a given situation.
- Describe sequences and series in various notations and identify their characteristics.
- Calculate sums of finite arithmetic and geometric series, evaluate limits, and apply the sum formula for geometric series.
- Apply the concept of geometric series to business finance applications such as annuities and perpetuities.
- Know the basics of functions and their key characteristics such as for example domain, range, symmetry, monotonicity, and convexity.
- Use elementary functions, such as polynomials, rational functions, algebraic functions, logarithmic functions, and exponential functions, and identify the characteristics of their graphs.
- Use functions as economic models, explain their key characteristics, and evaluate their results.
- Know the fundamentals of differential calculus such as the limit of a function or the concept of continuity.
- Calculate and interpret the derivative as the instant rate of change of a function.
- Know the derivatives of the elementary functions and correctly apply the basic differentiation rules.

Module Content

- Set notation and set operations, interval notation, sums, and sigma notation
- Sequences and convergence
- Series and summation formulas for arithmetic and geometric series
- Basic financial mathematics, annuities, and perpetuities
- Basics of functions
- Elementary functions (polynomials, rational and algebraic functions)
- Exponential and logarithm functions
- Economic functions and selected economic applications
- Fundamentals of differential calculus
- Derivatives and differentiation rules

Links to other modules

This module is linked to the following modules:
- w.BA.XX.2Stat.XX
- w.BA.XX.2QMeth.XX
- w.BA.XX.2OP.XX
- w.BA.XX.2Mathe2.XX
- w.BA.XX.2Mark.XX
- w.BA.XX.2MAcc.XX
- w.BA.XX.2FIPT.XX
- w.BA.XX.2CFRM.XX
- w.BA.XX.2AIM.XX

Digital Learning Resources

- Teaching Videos
- Teaching Materials
- Practice and Application Exercises (with Key)

Methods of Instruction

- Lecture
- Exercises
- Interactive Instruction
- Discussion

Social Settings Used:
- Individual Work

Type of Instruction

	Classroom Instruction	Guided Self-Study	Autonomous Self-Study
Large Class	28 h	-	
Small Class	14 h	16 h	
Group Instruction	-	-	
Practical Work	-	-	
Seminar	-	-	
Total	**42 h**	**16 h**	**32 h**

Module description: Mathematics 1

Performance Assessment

End-of-module exam	Form	Length (min.)	Weighting
Written exam	Specified documentation	90	100
Permitted Resources	Spec. calculator acc. to leaflet "Utilities"	With dictionary	

Others	Assessment	Length (min.)	Weighting
-	-	-	-

Classroom Attendance Requirement

None

Attendance not compulsory, but highly recommended

Compulsory Reading

- Scherrer, B., Becker, J., Bruer, M. & Sickinger, W. (2021). Wirtschaftsmathematik 1: Übungen und Lösungen. 4th edition. Zürich: Compendio. ISBN 978-3-7155-4826-5.
- Scherrer, B., Becker, J., Bruer, M. & Sickinger, W. (2021). Wirtschaftsmathematik 1: Theorie und Beispiele. 3rd edition. Zürich: Compendio. ISBN 978-3-7155-4825-8.

Recommended Reading

- Van de Craats, J. & Bosch, R. (2010). Grundwissen Mathematik - Ein Vorkurs für Fachhochschule und Universität. 1st edition. Heidelberg: Springer Berlin. ISBN 978-3-642-13501-9. Jan van de Craats is a Professor at the University of Amsterdam. Rob Bosch is a senior lecturer at the Nederlandse Defensie Academie.
- Purkert, W. (2014). Brückenkurs Mathematik für Wirtschaftswissenschaftler. 8th edition. Wiesbaden: Springer Fachmedien Wiesbaden. ISBN 978-3-8348-1932-1.
- Tietze, J. (2014). Einführung in die angewandte Wirtschaftsmathematik. 17th edition. Wiesbaden: Springer Spektrum. ISBN 978-3-658-02360-7.

Comments

A refresher course covering the mathematics curriculum of the vocational baccalaureate is offered in August and September. A self-assessment test to assess your level of mathematical knowledge is available online.