Valid from 2024.HS

Module description: Mathematics 1

Module Code	w.BA.XX.3Mathe1-FLEX.XX
ECTS Credits	3
Language of Instruction/Examination	German
Module Description	Students know, understand, and have mastered the basic mathematical tools of analysis in the areas of sequences and series, financial mathematics, functions, and differential calculus. They will be able to use these tools to formalize, model, and solve quantitative business and economic problems.
Organizational Unit	IRI Ltg.
Module Coordinator	Wolfgang Sickinger
Deputy Module Coordinator	Andreas Haldimann
Program and Specialization	• Business Administration - Specialization in Banking and Finance (FLEX) • Business Administration - Specialization in General Management (Flex)
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	Knowledge of mathematics in accordance with the Swiss federal vocational baccalaureate (commercial).
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 • Intercultural Insight & Ability to Change Perspective **Self-Competence** • Self-Management & Self-Reflection • Ethical & Social Responsibility • Learning & Change

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Module Learning Objectives

Students...
- use different quantity notations and apply them according to the situation.
- write down sequences and series in different notations and describe their properties.
- can apply the summation formulas for finite or infinite arithmetic and geometric series.
- use the concept of geometric series in the calculation of annuities.
- know the concept of functions and can explain important properties of functions, especially concavity, convexity, and monotonicity.
- can work formally and graphically with elementary types of functions (linear functions, polynomials, fractional rational functions, root functions, logarithm functions, and exponential functions).
- can apply elementary functions as economic models, rewrite them, and evaluate their results.
- know the basics of differential calculus, such as the concept of limits, continuity, and the concept of derivatives.
- can calculate derivatives of functions and interpret them as their local rate of change.
- can reproduce and apply the elementary derivation rules such as the factor and sum rule.

Module Content

- Sets, intervals, and sums
- Sequences and convergence
- Series and sum formulas for arithmetic and geometric sequences
- Interest rate calculation and rent calculation
- Introduction to functions
- Elementary functions (polynomial, rational, and algebraic functions)
- Exponential function and logarithm function
- Economic functions and selected economic applications
- Introduction to differential calculus
- Derivations and derivation rules

Links to other modules

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

Digital Learning Resources

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

Methods of Instruction

- Exercises
- Lecture
- Literature Review
- Application Tasks
- Interactive Instruction

Social Settings Used:
- Pair Work
- Individual Work

Type of Instruction

	Classroom Instruction	Guided Self-Study	Autonomous Self-Study
Large Class	-	-	
Small Class	21 h	37 h	
Group Instruction	-	-	
Practical Work	-	-	
Seminar	-	-	
Total	**21 h**	**37 h**	**32 h**

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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

Students are advised to attend all classes.

Compulsory Reading

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

Recommended Reading

- Tietze, J. (2014). Einführung in die angewandte Wirtschaftsmathematik. 17. Auflage. Wiesbaden: Springer Spektrum. ISBN 978-3-658-02360-7.
- Van de Craats, J. & Bosch, R. (2010). Grundwissen Mathematik - Ein Vorkurs für Fachhochschule und Universität. 1. Auflage. Heidelberg, Berlin: Springer. ISBN 978- 3-642-13501-9.
- Tietze, J. (2014). Einführung in die angewandte Wirtschaftsmathematik. 17. Auflage. Wiesbaden: Springer Spektrum. ISBN 978-3-658-02360-7.
- Purkert, W. (2014). Brückenkurs Mathematik für Wirtschaftswissenschaftler. 8. Auflage. Wiesbaden: Springer Fachmedien Wiesbaden. ISBN 978-3-8348-1932-1.
- Purkert, W. (2014). Brückenkurs Mathematik für Wirtschaftswissenschaftler. 8. Auflage. Wiesbaden: Springer Fachmedien Wiesbaden. ISBN 978-3-8348-1932-1.

Comments