Module Outline

Virtual Exchange Autumn Semester 2023_24

Business Mathematics and Statistics 1

5 ECTS-Credits

Format of the course: Synchronous online course

Number of Students accepted: 35

Responsible lecturers

The module consists of two parts: Business mathematics and business statistics. The parts are taught by two lecturers at the School of Business, University of Applied Sciences Northwestern Switzerland FHNW (Riggenbachstrasse 16, 4600 Olten, Switzerland):

- Dr. Tobias Schoch, professor of applied statistics (tobias.schoch@fhnw.ch)
- Dr. Thomas Heimsch, lecturer of mathematics (thomas.heimsch@fhnw.ch)

Tobias Schoch is the head of the module and will serve as single point of contact for this module.

n|w University of Applied Sciences and Arts Northwestern Switzerland
School of Business

Table of Contents

1. Course content

Mathematical and statistical methods are central instruments in today's economy. Managers need to be familiar and feel secure when working with data and quantitative information. Students gain knowledge and practical experience in the area of mathematical and statistical techniques relevant to business. Students develop analytical problem skills and be able to make managerial decisions based on empirical data and analysis.

2. Learning objectives

Part: Business Mathematics

- Repetition of basic mathematical concepts (algebra, functions)
- Equations and Functions: Solving equations and systems of equations. Definition of a function, basic functions
- Economic applications, e.g., cost and profit functions, supply and demand functions, break- even point, growth and decay functions
- Mathematics of Finance: Arithmetic and geometric sequences. Interest, regular payments, present and future values
- Economic applications, e.g., annuities, bonds, loans, and amortization

Part: Business Statistics

- Descriptive statistics: Data, data sources, variables. Summary statistics (e.g., mean, median, variance, standard deviation). Categorical and quantitative data. Tables and graphs (frequency tables, histograms, boxplots, scatterplots, time series plots). Contingency tables. Simple linear Regression (Estimation, Quality, Prediction)
- Economic applications, e.g., market research, insurance, quality control
- Probability: Combinatorics (permutation, combination). Laplace's probability definition, set notation, events, independence, conditional probability. Probability rules (addition, multiplication). Binomial distribution.

3. Prior knowledge and entry requirements

Mathematical and statistical knowledge equivalent to the Swiss Commercial Vocational Baccalaureate (comparable with High School Diploma)

4. Course structure and dates

Note: Switzerland uses Central European Time (CET) during the winter as standard time, which is one hour ahead of Coordinated Universal Time (UTC+01:00), and Central European Summer Time (CEST) during the summer as daylight saving time, which is two hours ahead of Coordinated Universal Time (UTC+02:00). Daylight saving time will begin on Sunday, March 26, 2023, and ends on Sunday, October 29, 2023.

5. Assessment

Students who are enrolled as regular students at the School of Business FHNW take an in-person written exam on campus (120 minutes, part 1: business mathematics, part 2: business statistics). For virtual exchange students, grading is based on an oral examination (15 minutes; online).

6. Literature

Sharpe / de Veaux / Velleman (2019). Business Statistics, 4th global edition, Pearson (ISBN 978-0-321-92583-1)

7. Grading

Pass-fail (for virtual exchange students)