Business Studies // School of Business Business Administration // Business Administration International Business // International Business VILLINGEN-SCHWENNINGEN



# Mathematics and Statistics (W3BW\_601)

## **Mathematics and Statistics**

FORMAL INFORMATION ON THE MODULE									
MODULE NUMBER	LOCATION IN THE COURS	SE OF STUDY	MODULE DURATION (SEMESTER)	MODULE RESPONSIBILITY	LANGUAGE				
W3BW_601	1st academic year		2	Prof Dr Joachim Weber	German/English				
FORMS OF TEACHING USED									
Lecture, exercise									
EXAM PERFORMANCE				SCOPE OF EXAMINATION (IN MINUTES)	RATING				
Exam				60	Yes				
Written exam or por	tfolio			60	Yes				
WORKLOAD AND ECTS CREDITS									
TOTAL WORKLOAD (IN	н)	OF WHICH AT	TENDANCE TIME (IN H)	OF WHICH SELF-STUDY (IN H)	ECTS CREDIT POINTS				
150		60		90	5				

## QUALIFICATION OBJECTIVES AND COMPETENCES

#### PROFESSIONAL COMPETENCE

On completion of the module, students have a basic knowledge and critical understanding of mathematics and statistics for economic issues. They are able to apply the methods and approaches to specific analysis, planning and decision-making problems and to present and interpret the results in a goal-oriented manner.

#### METHODOLOGICAL EXPERTISE

Students have grasped the ideas of mathematical techniques and have acquired the skills to apply them to economic issues. They have understood statistics as a decision-making aid in business practice or as an aid in the empirical testing of hypotheses and have acquired the ability to explain the possible influence of the data creation process, the data sources and the data presentation on the result and to independently analyse and assess given data sets with regard to the desired information.

#### PERSONAL AND SOCIAL COMPETENCE

On completion of the module, students know that quantitative methods one way (among others) of gaining knowledge, in particular that reality cannot be depicted in figures alone. They are aware of the influence of the methods on the result and are thus sensitised to a responsible approach.

#### OVERARCHING COMPETENCE

LEARNING UNITS AND CONTENT

Students have gained an overview of the possible applications of mathematical and statistical methods economics and business administration and have practised their application using appropriate examples. This enables them to apply these methods independently and to analyse the results in a factual context.

TEACHING AND LEARNING UNITS	PRESENCE TIME	SELF-STUDY
Mathematics	30	45

- Fundamentals of mathematics (sets of numbers, basic algebraic structures, logic)

- Analysis (essential elements of calculus for functions with one and more independent variables)

- Financial mathematics (sequences and series, applied financial mathematics)

- Linear algebra (systems of equations, matrices, vectors, determinants)

- Subject-related extensions according to subject relevance and previous student knowledge.

### LEARNING UNITS AND CONTENT

TEACHING AND LEARNING UNITS	PRESENCE TIME	SELF-STUDY
Statistics	30	45

- Basics (data creation)

- Descriptive statistics (univariate and multivariate frequency distributions with their descriptive measures)

- Inductive statistics (especially probability theory)

Inferential statistics (estimates, test procedures, economic statistical applications)

- Subject-related extensions according to subject relevance and previous student knowledge

## SPECIAL FEATURES

Module with two examinations

- Exam after the first semester

- Written exam or portfolio examination after the second semester

- The examination duration refers only to the written examination

## PREREQUISITES

## LITERATURE

- Bamberg, G./Baur, F./Krapp, M.: Statistics, Munich: Oldenbourg
- Bleymüller, J./Gehlert, G./Gülicher, H.: Statistik für Wirtschaftswissenschaftler, Munich: Vahlen

- Bosch, K.: Mathematics for economists, Munich: Oldenbourg

- Bronstein, I./Semendjajev, K. A.: Taschenbuch der Mathematik, Thun/Frankfurt a. M.: Verlag Harri Deutsch
- Heinrich, G.: Basiswissen Mathematik, Statistik und Operations Research für Wirtschaftswissenschaftler, Munich: Oldenbourg
- Holey, T./Wiedemann, A.: Mathematik für Wirtschaftswissenschaftler, Heidelberg: Physica-Verlag
- Sachs, M.: Wahrscheinlichkeitsrechnung und Statistik, Munich: Hanser
- Stiefl, J.: Wirtschaftsstatistik, Munich: Oldenbourg
- Sydsaeter, K./Hammond, P.: Mathematik für Wirtschaftswissenschaftler, Hallbergmoos: Pearson Studium
- Tietze, J.: Einführung in die angewandte Wirtschaftsmathematik, Wiesbaden: Springer Spektrum
- Tietze, J.: Einführung in die Finanzmathematik, Wiesbaden: Springer Spektrum