

2020.HS

Module Name: Research Skills	
Module Code	w.MA.XX.FOM-M4.16HS
Module Description	Students learn to analyze economic issues using statistical methods. In the first part of the module, descriptive statistics is discussed. Well-known concepts are briefly reviewed and new ones introduced (esp. concentration measurement, indexes, and indices). The second part deals with probability theory, which lays the basics of inductive statistics, which is handled in the third part. Here interval estimators are discussed and one- and two-sample hypothesis tests explained. Besides parameter tests (proportion, the mean, and variance), distribution tests are also presented. Statistical analyses are carried out in R.
Program and Specialization	Accounting and Controlling
Legal Framework	Academic Regulations MSc in Accounting and Controlling dated 10.12.2015, Appendix to the Academic Regulations for the degree program in Accounting and Controlling, first adopted on 26.01.2016
Module Category	Module Type: Compulsory
ECTS	9
Organizational Unit	W Abt. Banking, Finance, Insurance Ltg.
Module Coordinator	Armin Bänziger-Aiba (banz)
Deputy Module Coordinator	Oliver Bachmann (bacl)
Prerequisite Knowledge	Mathematics and statistics at Bachelor's degree in business administration level: <ul style="list-style-type: none"> • Sigma sign (sums), powers, logarithms, elementary functions, differential calculus, fundamentals of integral calculus are desirable. • Measure of central location and dispersion, basics of probability theory, binomial distribution, normal distribution, student distribution, correlation
Contribution to Program Learning Goals (Affected by 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
Module Learning Objectives	Students... § know how to use statistical techniques for analyzing (economic) data. § know which methods are used for which data type. § understand confidence intervals and hypothesis testing. § can use case-related statistical methods. § construct confidence intervals for averages, percentage values, and variances. § test hypotheses for means, proportions, and averages. § analyze data in R. § evaluate hypotheses with sample data. § analyze, interpret, and question empirical results. § study individual sections of the teaching material autonomously. § solve the exercises in teaching materials or the exercise book.

	§ solve application-oriented exercises with R autonomously.		
Module Content	§ Fundamentals: Matrix operations and introduction to the R programming environment § Descriptive statistics: Basic concepts, one-dimensional frequency distributions (central tendency and dispersion measures, higher moments, concentration measurement), two-dimensional frequency distribution (contingency tables, correlation analysis [Bravais-Pearson, Spearman, coefficient of contingency], linear transformations), indices, implementation in R § Fundamentals of probability theory: Probability rules, random sampling, and combinatorics, discrete and continuous random variables, multidimensional random variables, application example (portfolio risk and diversification), implementation in R § Discrete and continuous probability distributions: binomial, hypergeometric, Poisson, exponential, normal, and log-normal distribution, test distributions (Chi-square, t, and F distribution), normal approximations of discrete distributions, implementation in R § Inductive statistics: Quality of estimators, point and interval estimation (mean, proportion, variance), hypothesis testing, two-sample tests (means, proportion, variances), distribution tests (chi-square tests), one-way analysis of variance, implementation in R		
Links to other modules	The content of this module is linked to the following modules: w.MA.XX.FIM-M6.16HS w.MA.XX.PFM-M9.16HS w.MA.XX.PM-M12.16HS w.MA.XX.POF-M11.16HS w.MA.XX.RA-M10.16HS		
Methods of Instruction	§ Lecture § Interactive Instruction § Application Tasks § Exercises	Social Settings Used: Individual Work	
Digital Resources	§ Teaching Videos § Practice and Application Exercises (with Key) § Multiple Choice Tests § Electronic aids: teaching materials (PDF), R environment, R scripts § R illustrations (scripts with questions to ensure understanding)		
Type of Instruction	Classroom Instruction	Guided Self-Study	Autonomous Self-Study
Lecture	64 h	-	
Excercise	-	140 h	
Project Work	-	-	
Seminar	-	-	
Total	64 h	140 h	
Performance Assessment			
End-of-module exam	Form	Length (min.)	Weighting
Written exam	Specified documentation	90	100,00 %
Permitted Resources	Approved calculator according to "Guidelines on Supplementary Materials"	With dictionary	
Others	Assessment	Length (min.)	Weighting
-	-	-	-
Students are not allowed to revise and resubmit performance assessment tasks.			
Classroom Attendance Requirement	Mandatory Attendance: None None		
Language of Instruction/Examination	German		
Compulsory Reading	§ Auer, B. & Rottmann, H. (2015). Statistik und Ökonometrie für Wirtschaftswissenschaftler: Eine anwendungsorientierte Einführung. 3rd edition. Wiesbaden: Springer Gabler. ISBN 978-3-658-06438-9.		
Recommended Reading	§ Newbold, P., Carlson, W. & Thorne, B. (2013). Statistics for Business and Economics (Global Edition). 8th edition. Upper Saddle River, N.J.: Pearson Prentice Hall. ISBN 978-0-273-76706-0. § Gujarati, D. (2015). Econometrics by Example. 2nd edition. London: Palgrave Macmillan. ISBN 978-1137375018.		
Comments	Module grade is rounded to a quarter of a full mark. "Statistik und Ökonometrie für Wirtschaftswissenschaftler" (compulsory reading) is freely available in the ZHAW Library as an e-book (PDF).		