Course Descriptions Bachelor 2021-2022

Course Title	Quantitative Methods II (EBE/FE)
Course Code	EBC1035
ECTS Credits	6,5
Assessment	Whole/Half Grades

Period

Period	Start	End	Mon	Tue	Wed	Thu	Fri
4	31-1-2022	25-3-2022	L		X		X

Level	Intermediate
Coordinator	Christian Kerckhoffs For more information:c.kerckhoffs@maastrichtuniversity.nl
Language of instruction	English
Goals	Introduction to the matrix representation of (linear) systems of equations, and to the (constrained) maximization or minimization of (nonlinear) functions of more than 1 variable. Introduction to the basic tools of inferential statistics, a.o. the independent-samples t-test, the paired-sample t-test, one-way-ANOVA, the chi-square test and regression analysis.
Description	QM II continues the quantitative topics that were initiated in QM I: mathematics and statistics. There is no separate formal training in (or testing of) computer science: this element has been integrated into the remaining two parts of the course. In the mathematics part, we will expand the analysis of functions and (systems of) equations. Issues that will be addressed are: - The matrix representation of systems of linear equations (so called linear algebra) will be introduced and supplemented by the concepts of determinants and inverse matrices, which are important tools to manipulate such systems. - The (constrained) maximisation or minimisation of (nonlinear) functions of more than 1 variable, using the Lagrange multiplier method. - Further topics include the chain rule, the slope of a level curve, homogeneous functions, and a collection of tools often used in finance but also in other fields (buzzwords: interest rates, present value, discounting, and geometric series). All these topics will be introduced and illustrated using economic or business applications, and functions that are often used in these fields (e.g. the Cobb-Douglas production function) will be analysed extensively. In the statistics part, we will expand the coverage of inferential statistics, i.e. how to draw conclusions about a population based on a sample. Students will learn to apply the basic tools of inferential statistics (confidence intervals and hypothesis tests) to examine a large array of questions that may occur in economics or business. We will focus on the following topics: -How to examine whether the mean of some quantitative variable (e.g. income) differs between two or more populations (e.g. men vs. women). Related to this, we will also examine what to do when the data are paired, and when the variable of interest is a proportion. -How to analyse relationships between qualitative variables (e.g. between brand preference and gender). -How to analyse relationships between two or more quantitative variables (e.g. between income and age) using regression analysis. This is one of the most frequently used statistical techniques in economics and business. All these issues will involve the use of real-life data, which will be analysed using EXCEL.
Literature	Sharpe, Norean D., De Veaux, Richard D., & Velleman, Paul F. (2018), Business Statistics and Extra Texts, 3rd ed., New York: Pearson Education International. QM1 + QM2 mathematics reader, to be downloaded on Student Portal.
Prerequisites	Basic knowledge of mathematics and statistics, comparable to the course Quantitative Methods I, code EBC1005/1006/1007.
Teaching methods	PBL / Lecture / Assignment
Assessment methods	Attendance / Written Exam
Evaluation in previous academic year	For the complete evaluation of this course please click http://iwio-sbe.maastrichtuniversity.nl/rapporten.asp?referrer=codeUM

This course belongs to the following programme / specialisation

Bachelor Fiscal Economics	Year 1 Compulsory Course(s)