Course Descriptions None 2024-2025

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	3-2-2025	30-3-2025	L		X		X

Level	Intermediate
Coordinator	Matthijs Hermeling For more information:matthijs.hermeling@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 R., Richard D. De Veaux and Paul F. Velleman (2019), Business Statistics and Extra Texts, 4th ed., New York: Pearson Education International, Maastricht University Edition. * QM1 and QM2 Mathematics Readers, to be downloaded on the course pages
Prerequisites	The course EBC1035 is in transition for the bachelor Fiscal Economics. This does NOT affect EBC1034. See the Bachelor Education and Examination Regulations for more information. The following rule applies to bachelor Fiscal Economics students. TRANSITIONAL REGULATION (EBC1035): The bachelor Fiscal Economics has been discontinued. There will be repeat education for year 1 and year 2 courses up to and including academic year 2025-2026 and exam-only up to and including academic year 2026-2027. For year 3 courses there will be repeat education up to and including 2026-2027 and exam-only up to and including academic year 2027-2028. Whether a course is in transition, cancelled, or replaced may depend on the cohort you are in. Sometimes there are additional criteria. It is therefore very important to carefully read the EER and the addendum so you can apply the rules to your individual situation. 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	Transitional Regulation