Course Descriptions None 2022-2023

Course Title	Quantitative Methods I
Course Code	EBC1006
ECTS Credits	6,5
Assessment	Whole/Half Grades

Period

Period	Start	End	Mon	Tue	Wed	Thu	Fri
1	5-9-2022	21-10-2022	L	X		L	X

Level	Introductory
Coordinator	Dirk Tempelaar For more information:d.tempelaar@maastrichtuniversity.nl
Language of instruction	English
Goals	Active mastery and knowledge of basic mathematical and statistical techniques.

Description

PLEASE NOTE THAT THE INFORMATION ABOUT THE TEACHING AND ASSESSMENT METHOD(S) USED IN THIS COURSE IS WITH RESERVATION. A RE-EMERGENCE OF THE CORONAVIRUS AND NEW COUNTERMEASURES BY THE DUTCH GOVERNMENT MIGHT FORCE COORDINATORS TO CHANGE THE TEACHING AND ASSESSMENT METHODS USED. THE MOST UP-TO-DATE INFORMATION ABOUT THE TEACHING/ASSESSMENT METHOD(S) WILL BE AVAILABLE IN THE COURSE SYLLABUS.

All students receive basic training in quantitative methods covering subjects from mathematics, statistics, and computer skills. The majority of this training is given in the first year. This period, you will be participating in what we call Quantitative Methods 1 (QM 1). It is followed by a second round of quantitative methods (QM 2) in period 4. In the second year, some additional subjects will be covered. The topics for the latter two courses and the period for the third course depend on your choice regarding study and specialization. In mathematics, we will repeat and extend your knowledge about functions and equations. Questions that play a role in this course are:
* How to translate a given problem into a mathematical model. Most of these problems are questions for a maximum or minimum value or the significance of the problem – mathematically, the existence of a solution.
* How to find maximum and minimum values for a function of one and two variables. We will make use of derivatives and partial derivatives to formulate equations and conditions for extreme values.
* How to solve a system of equations, especially linear equations.

In statistics, we will focus on the following topics:
* Methods of data collection and types of data.
* Descriptive statistics: describing important characteristics of populations or samples by numerical methods as the mean, median, mode (measures of central tendency), variance, and standard deviation (measures of spread) as well as by graphical methods, like histograms, bar charts, or Box-and-Whiskers displays.
* Probability theory, as an introduction to random variables.
* Discrete random variables and the most important discrete probability distribution: the binomial distribution.
* Continuous random variables and two continuous probability distributions: the uniform and the normal distribution.
* Sampling distributions, as a first step to the topic that will dominate the QM statistics agenda from now on: inferential statistics, or inductive reasoning. Understanding why large samples provide so much more information than small samples is an important element of this first step.
* The construction of confidence intervals to estimate unknown population parameters and
* Hypothesis testing in the simplest case of one population. This includes concepts as null and alternative hypothesis, type I and type II errors, and the p-value of a hypothesis test.

Literature

For mathematics, we will use a reader as required text:
* QM 1 MATHEMATICS.

That reader will be made available in the StudentPortal, for free. In addition to this text, you will need to acquire a license for the calculus course in the:
* SOWISO digital learning environment The statistics subject matter of this block corresponds to chapters 1-3, 5-12 of the Sharpe et al. textbook, which is the prescribed literature for both QM 1 and QM 2:
* Sharpe, Norean R., De Veaux, Richard D., & Velleman, Paul F. (2019): Business Statistics, 4th ed. New York: Pearson Education International, Maastricht University Edition. Sharpe et al. is available through StudyStore in a bundle with a license of:
* MyStatLab Student Access Kit. The most economical way to buy this textbook is as a wrapping, at StudyStore, the academic bookstore: the UM custom pack 9781787649811 CU.

Prerequisites	Math secondary school at "minor" level.
Teaching methods	PBL / Assignment / Papers
Assessment methods	Final Paper / Written Exam / Assignment
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 Economics and Business Economics - Economics	Year 1 Compulsory Course(s)
Bachelor Economics and Business Economics - Emerging Markets	Year 1 Compulsory Course(s)
Bachelor Economics and Business Economics - Economics and Management of Information	Year 1 Compulsory Course(s)
Bachelor Economics and Business Economics - International Business Economics	Year 1 Compulsory Course(s)