Course Descriptions None 2025-2026

Course Title	Mathematics and Statistics 1
Course Code	EBC1051
ECTS Credits	6,5
Assessment	Whole/Half Grades

Period

Period	Start	End	Mon	Tue	Wed	Thu	Fri
1	1-9-2025	17-10-2025	X	X		X	

Level	no level
Coordinator	Daniel Velasquez Gaviria For more information:d.velasquezgaviria@maastrichtuniversity.nl
Language of instruction	English
Goals	* Being able to use calculus to build and develop mathematical models. * Being able to use calculus to solve models. * Understanding of main statistical concepts and methods that shape descriptive statistics, probability models, and sampling. * Apply main statistical concepts and methods that shape descriptive statistics, probability models, and sampling. * Being able to reason what statistical concepts and methods match business analytics cases. * Judging about the correctness of applying statistical concepts and methods in business analytics cases. * Reflect on the choice for methods and their application in business analytics cases.
Description	This course offers a wide range of calculus and statistics concepts. The subject areas covered in this course are fundamental for the mathematical and statistical aspects of data science and for most branches of economic and engineering sciences. Both the intuition behind the concepts and their formal definitions will be presented along with simple examples of formal mathematical proofs. The topics discussed in the first part of the course include, among others, limits, continuity, differentiation and specific function derivatives, partial derivatives, gradients and series. Statistics focuses on the collection and analysis of numerical data, typically in large amounts. With the ultimate aim of doing inference: formulate conclusions and make decisions that relate to an unknown population, based on data collected in a sample. We call this type of inferential reasoning also induction, to distinguish it from the type of reasoning applied in mathematics: deduction. The main aim of the statistics education in the first two periods is to introduce you to the main tools of inferential statistics, like hypothesis testing, confidence intervals, regression. However, we cannot start right away with these topics since they require a foundation. These foundational topics shape the Statistics I curriculum: descriptive statistics, how to describe the characteristics of data with graphs and numerical summaries, probability theory and sampling theory are buildings blocks to be mastered before starting to learn inference. Next to statistical analysis, this course aims to introduce you to statistical computing with the spreadsheet program Excel.
Literature	MathReader (available in Canvas) and OpenIntro Statistics, 4th Ed (open source)
Prerequisites	High school mathematics
Keywords	Calculus; Statistics
Transitional Regulations	
Teaching methods	
Assessment methods	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 Business Analytics — Year 1 Compulsory Courses