Syllabus

Course Description

Course Title	Mathematics for Economists
Course Code	27356
Course Title Additional	
Scientific-Disciplinary Sector	
Language	English
Degree Course	Bachelor in Economics and Management
Other Degree Courses (Loaned)	
Lecturers	Prof. Dr. Martin Meier, Martin.Meier@unibz.it https://www.unibz.it/en/faculties/economics-management/academic-staff/person/50913 Dr. Paolo Maraner, PMaraner@unibz.it https://www.unibz.it/en/faculties/economics-management/academic-staff/person/12920
Teaching Assistant	
Semester	All semesters
Course Year/s	1
CP	12
Teaching Hours	36+36
Lab Hours	60+60
Individual Study Hours	-
Planned Office Hours	18+18
Contents Summary	M1: The course "Mathematics for Economists M1" deals with basic mathematical concepts like sets, relations, functions, numbers, limits and absolute values. Moreover we will introduce functions of one variable by studying their basic properties, derivatives and their calculus, Taylor approximations and the Newton's method. We will also address the single-variable optimization (Fermat's rule and sufficient optimality conditions) and the elements of

	integration. M2: In this course we study linear algebra and functions of several variables.
Course Topics	M1: Sets, relations, functions. Basic algebra, numbers, approximations, sequences and their limits, series, geometric series. Real functions (polynomial, rational, irrational, exponential and logarithmic functions), limits of functions, differentiation,Taylor approximations, Newton's method, convexity, single variable optimization, integration. M2: 1. Matrix calculus, rank and linear independence, systems of linear equations, Gaussian elimination, applications. 2. Functions of several variables: gradients, Hesse matrices, Taylor approximation, convexity. 3. Multivariable optimization, Lagrange method and economic applications. Simple least square regression. 4. If enough time remains: Basics of probability theory.
Keywords	mathematics for economists, sets, relations, functions, linear algebra, optimization
Recommended Prerequisites	none
Propaedeutic Courses	none
Teaching Format	Lectures and exercise sessions
Mandatory Attendance	
Specific Educational Objectives and Learning Outcomes	ILO 1 Knowledge and understanding ILO 1.1 knowledge of basic and intermediate level mathematical tools for understanding and analysing economic mechanisms through theoretical models and empirical applications ILO 2 Apply knowledge and understanding ILO 2.1 know how to analyse (unconstrained) optimisation problems and mathematically interpret models of social and economic dynamics ILO2.2 knowing how to work with basic and intermediate level mathematical and basic level statistical tools to study the behaviour of economic subjects, from a theoretical and empirical point of view

	ILO 3 Making judgements ILO 3.1 choose the most appropriate quantitative and qualitative methods of analysis ILO 4 Learning skills ILO 4.1 analyse, critically process and integrate data, information and future experience, also using advanced software
Specific Educational Objectives and Learning Outcomes (additional info.)	
Assessment	M1: A written final exam (questions and problems to solve) which counts 100% for the M1 partial grade. ILO 1.1, ILO 2.1, ILO 3.1, ILO 4.1. M2: A written final exam (questions and problems to solve) which counts 100% for the M2 partial grade. ILO 1.1, ILO 2.1, ILO 3.1, ILO 4.1. The final mark is the average of the marks of M1 and M2 - There is no different assessment for attending and non-attending students.
Evaluation Criteria	Final grade: 50% grade for M1 partial grade, 50% for M2 partial grade. The results of assignments and partial exams are only valid for the academic year in question. They cannot be carried over beyond that time frame.
Required Readings	Lecture Slides that will be uploaded in the reserve collection.
Supplementary Readings	None.
Further Information	
Sustainable Development Goals (SDGs)	No poverty, Partnerships fot the goals, Good health and well-being, Quality education, Gender equality, Clean water and sanitation, Affordable and clean energy, Decent work and economic growth, Industry, innovation and infrastructure, Reduced inequalities, Sustainable cities and communities, Responsible consumption and production, Climate action, Life below water, Life on land, Peace, justice and strong institutions, Zero hunger

Course Module

Course Constituent Title	Mathematics for Economists 1
Course Code	27356A
Scientific-Disciplinary Sector	STAT-04/A
Language	English
Lecturers	Prof. Dr. Martin Meier, Martin.Meier@unibz.it https://www.unibz.it/en/faculties/economics-management/academic-staff/person/50913
Teaching Assistant	
Semester	First semester
CP	6
Responsible Lecturer	
Teaching Hours	36
Lab Hours	60
Individual Study Hours	
Planned Office Hours	18
Contents Summary	The course "Mathematics for Economists M1" deals with basic mathematical concepts like sets, relations, functions, numbers, limits and absolute values. Moreover we will introduce functions of one variable by studying their basic properties, derivatives and their calculus, Taylor approximations and the Newton's method. We will also address the single-variable optimization (Fermat's rule and sufficient optimality conditions) and the elements of integration.
Course Topics	Sets, relations, functions. Basic algebra, numbers, approximations, sequences and their limits, series, geometric series. Real functions (polynomial, rational, irrational, exponential and logarithmic functions), limits of functions, differentiation,Taylor approximations, Newton’s method, convexity, single variable optimization, integration.
Teaching Format	Lectures and exercise sessions.
Required Readings	Lecture notes provided in due course (available in the Reserve Collection).

Supplementary Readings	

Course Module

Course Constituent Title	Mathematics for Economists 2
Course Code	27356B
Scientific-Disciplinary Sector	STAT-04/A
Language	English
Lecturers	Prof. Dr. Martin Meier, Martin.Meier@unibz.it https://www.unibz.it/en/faculties/economics-management/academic-staff/person/50913
Teaching Assistant	
Semester	Second semester
CP	6
Responsible Lecturer	
Teaching Hours	36
Lab Hours	60
Individual Study Hours	
Planned Office Hours	18
Contents Summary	In this course we study linear algebra and functions of several variables.
Course Topics	1. Matrix calculus, rank and linear independence, systems of linear equations, Gaussian elimination, applications. 2. Functions of several variables: gradients, Hesse matrices, Taylor approximation, convexity. 3. Multivariable optimization, Lagrange method and economic applications. Simple least square regression. 4. If enough time remains: Basics of probability theory.
Teaching Format	Lectures and exercise sessions.
Required Readings	Lecture notes provided in due course (available in the Reserve Collection)
Supplementary Readings	