Freie Universität Bozen
Libera Università di Bolzano
Università Liedia de Bulsan

Syllabus
Course description

Course title	**Preparatory Course in Mathematics – Mathematics for Economists**
Course code	99999
Scientific sector	SECS-S/06
Degree	
Semester and academic year	28.08.2017 – 08.09.2017
Year	1st year
Credits	-
Modular	No
Total lecturing hours	30
Total lab hours	-
Total exercise hours	-
Attendance	recommended, but not required
Prerequisites	not required
Specific educational objectives	The course refers to the educational activities chosen by the student and belongs to the scientific area of Statistics -Mathematics. The course gives a general overview of scientific contents. Precalculus Mathematics is reviewed which prepares for the Mathematics for Economists course. The course is directed to 1st year students who are going to attend the Mathematics for Economists course. Educational objectives: (1) Refresh mathematical knowledge taught in high school, fill gaps and add a few new insights. (2) Motivate to experience and communicate (about) Mathematics.

Lecturer	Carola Schrage Office E202 Carola.schrage@unibz.it Tel.: +39 0471 013284 https://www.unibz.it/it/faculties/economics-management/academic-staff/person/34564-carola-schrage
Scientific sector of the lecturer	SECS-S/06
Teaching language	English
Office hours	-
Lecturing assistant	-
Teaching assistant	-
Office hours	-
List of topics covered	1. Basic mathematical language: Sets and logic. 2. Numbers and their properties: Integers: addition and subtraction, multiplication and division, powers and roots. Negative numbers. Absolute value. Rational numbers: fractional, decimal, percentage representation. Irrational numbers. Order properties. The numerical line. Real numbers. 3. Elementary algebra. Symbols. Operations with symbols: commutative, associative, neutral element, inverse element and

	distributive properties. Brackets. Expanding and factorizing. Algebraic expressions. Monomials, polynomials, rational and irrational expressions. Elementary theorems of algebra: powers of a binomial; difference of powers. Operations with polynomials. Factorization of a polynomial: roots and the fundamental theorem of algebra. 4. Functions - basics. Real functions. Graph of a real function. Operations with real functions. Elementary functions: constant, linear, quadratic, polynomial function. 5. Exponentials and logarithms. Powers and exponentials: definition and properties. Roots and logarithms: definition and properties. Polynomial approximation to exponentials. The number e. Natural exponential and logarithms. 6. Equations and inequalities. Polynomial equations: linear, quadratic and higher order. Solution versus factorization. Polynomial inequalities. Simultaneous equations. Exponential and logarithmic equations and inequalities. 7. Functions - advanced. Composition of functions. Inverse function. Translations, reflections and absolute value of a function. Symmetries of a function. More examples.
Teaching format	Lectures and exercises.
Learning outcomes	**Knowledge and understanding**: Basic mathematical knowledge will be revised and consolidated, familiarity with elementary solution procedures (e.g. for quadratic equations or finding the equation of a straight line) will be generated. **Applying knowledge and understanding**: By elementary examples from economic theory, a basic understanding for the necessity of mathematical modeling in economics is aimed for. **Making judgments**: The ability to make fundamental distinctions in Mathematics (linear vs. nonlinear, first order vs. higher order etc.) is aimed for. Moreover, a first intuition for quantitative vs. qualitative models should be provided. **Communication skills:** Basic abilities to apply a mathematical language in an economical framework will be aimed for. The students will be challenged to talk to the professor and to each other about mathematical constructions. **Learning skills**: Prepares for the Mathematics for Economists course which requires a solid understanding of mathematical concepts.
Assessment	Only informal assessment.
Assessment language	English
Evaluation criteria and criteria for awarding marks	No marks/grades.
Required readings	Will be announced at the beginning of the course.
Supplementary readings	Will be announced at the beginning of the course.