

## Syllabus

### Course description

<b>Course title</b>	Preparatory course in Mathematics – Mathematics for Economics
<b>Course code</b>	30152
<b>Scientific sector</b>	SECS-S/06
<b>Degree</b>	Tourism, Sport and Event Management
<b>Semester and academic year</b>	28.08.2017 – 09.09.2017
<b>Year</b>	1st year
<b>Credits</b>	-
<b>Modular</b>	No

<b>Total lecturing hours</b>	30
<b>Total lab hours</b>	-
<b>Total exercise hours</b>	-
<b>Attendance</b>	recommended, but not required
<b>Prerequisites</b>	not required
<b>Course page</b>	<a href="https://www.unibz.it/en/faculties/economics-management/bachelor-tourism-sport-event-management/course-offering/">https://www.unibz.it/en/faculties/economics-management/bachelor-tourism-sport-event-management/course-offering/</a>

<b>Specific educational objectives</b>	<p>The course refers to the educational activities chosen by the student and belongs to the scientific area of Statistics -Mathematics.</p> <p>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 1<sup>st</sup> year students who are going to attend the Mathematics for Economists course.</p> <p>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.</p>
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<b>Lecturer</b>	Prof. Dr. rer. nat. habil. Andreas Hamel, <a href="mailto:Andreas.Hamel@unibz.it">Andreas.Hamel@unibz.it</a> , Tel: 0474 013651, Bruneck-Brunico Campus 1 <sup>st</sup> Floor – Professors Room 1.11, <a href="https://www.unibz.it/en/faculties/economics-management/academic-staff/person/33708-andreas-heinrich-hamel">https://www.unibz.it/en/faculties/economics-management/academic-staff/person/33708-andreas-heinrich-hamel</a>
<b>Scientific sector of the lecturer</b>	SECS-S/06
<b>Teaching language</b>	English
<b>Office hours</b>	-

<b>Lecturing assistant</b>	-
<b>Teaching assistant</b>	-
<b>Office hours</b>	-
<b>List of topics covered</b>	<ul style="list-style-type: none"> <li>• Basic mathematical language: Sets and logical expressions.</li> <li>• Numbers and their properties: integers, rational and irrational numbers, the real line, order properties.</li> <li>• Elementary algebraic rules: commutativity, associativity, neutral element, inverse element and distributivity. Expanding and factorizing.</li> <li>• Algebraic expressions: monomials, polynomials, rational and irrational expressions. Elementary theorems of algebra: powers of a binomial. Operations with polynomials. Factorization of a polynomial: roots and the fundamental theorem of algebra.</li> <li>• Functions: definition, examples, real functions and their graphs. Elementary functions: constant, linear, quadratic, polynomial functions.</li> <li>• 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.</li> <li>• Equations and inequalities. Polynomial equations: linear, quadratic and higher order. Solution versus factorization. Polynomial inequalities. Simultaneous equations. Exponential and logarithmic equations and inequalities.</li> <li>• Basic geometry: Cartesian frame of reference. Coordinates and points. Distance. Lines and equations. The straight line: implicit and explicit equation, slope and intercept, distance between a point and a straight line. A geometrical approach to inequalities. The circle: equation, centre and radius.</li> </ul>
<b>Teaching format</b>	Lectures and exercises.
<b>Learning outcomes</b>	<p><b><u>Knowledge and understanding:</u></b> 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.</p> <p><b><u>Applying knowledge and understanding:</u></b> By elementary examples from economic theory, a basic understanding for the necessity of mathematical modeling in economics is aimed for.</p> <p><b><u>Making judgments:</u></b> 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.</p>

	<p><b>Communication skills:</b> 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.</p> <p><b>Learning skills:</b> Prepares for the Mathematics for Economists course which requires a solid understanding of mathematical concepts.</p>
<b>Assessment</b>	Only informal assessment.
<b>Assessment language</b>	English
<b>Evaluation criteria and criteria for awarding marks</b>	No marks/grades.
<b>Required readings</b>	<p>Manual of Precalculus Mathematics, J.G. Brida. ISBN 978-88-6046-027-1. Bozen-Bolzano University Press, 2009.</p> <p>The book is available at the university library:  <a href="http://www.unibz.it/en/public/universitypress/publications/default.html">http://www.unibz.it/en/public/universitypress/publications/default.html</a></p>
<b>Supplementary readings</b>	Will be announced at the beginning of the course.