

COURSE DESCRIPTION – ACADEMIC YEAR 2021/2022

Course title	Introduction to Analysis and Optimization Techniques
Course code	76436
Scientific sector	MAT/05
Degree	Bachelor in Informatics and Management of Digital Business (L-31)
Semester	2
Year	1
Credits	6
Modular	No
Total lecturing hours	40
Total lab hours	20
Attendance	Attendance is not compulsory, but recommended. Non-attending students have to contact the lecturer at the start of the course.
Prerequisites	not required
Course page	https://ole.unibz.it/
Specific educational objectives	The course belongs to the type "di base – formazione matematico-fisica". The aim of this course is to introduce students to the following topics: sequences and series, univariate functions, derivatives and differential calculus with some applications, basic optimization techniques (necessary and sufficient optimality conditions, a numerical method), integrals, discrete (financial) market models, and mathematical methods for decision making.
Lecturer	Daniela Visetti
Contact	Campus Bruneck- Brunico, 1 st Floor, Room 1.08, daniela.visetti@unibz.it , +39 0474 013642
Scientific sector of lecturer	SECS-S/06
Teaching language	English
Office hours	During the teaching period - will be announced in class and on the course page.
Lecturing Assistant (if any)	Oswald Lanz
Contact LA	TBD
Office hours LA	TBD
List of topics	<ul style="list-style-type: none"> • Sequences and series • Univariate functions • Derivatives and differentials • Indefinite and Riemann integrals • Basic optimization techniques in one variable • Mathematical tools for decision making without and with uncertainty
Teaching format	This course will be delivered through a combination of formal lectures and exercises.

Learning outcomes	<p>Knowledge and understanding:</p> <ul style="list-style-type: none"> • D1.1 - Possess basic knowledge of mathematical analysis, algebra, numerical calculation and optimisation methods which support computer science and advanced economics. <p>Applying knowledge and understanding:</p> <ul style="list-style-type: none"> • D2.1 - Ability to use mathematics and statistical data analysis tools to solve computational problems. <p>Learning skills</p> <ul style="list-style-type: none"> • D5.1 - Learning ability to undertake further studies with a high degree of autonomy.
Assessment	<p>Written exam</p> <p>The written exam consists of a set of verification questions, transfer of knowledge questions and exercises. The aim of the assessment is to check to which degree students have mastered the following learning outcomes: 1) knowledge and understanding, 2) applying knowledge and understanding.</p>
Assessment language	English
Assessment Typology	Monocratic
Evaluation criteria and criteria for awarding marks	<p>Final Written Exam, 100% covering the full program.</p> <p>Written exam questions will be evaluated in terms of correctness, clarity, quality of argumentation and problem solving ability.</p> <p>Evaluation criteria are the same for attending and non-attending students.</p>
Required readings	<p>Lecture Notes will be provided during the semester. Further required readings will be announced at the beginning of the course.</p> <p>Subject Librarian: David Gebhardi, David.Gebhardi@unibz.it</p>
Supplementary readings	Will be announced at the beginning of the course.
Software used	No software required.