Syllabus
Course description

Course title	Mathematics for EPE
Course code	27279
Scientific sector	SECS-S/06
Degree	Bachelor in Economics, Politics and Ethics
Semester and academic year	1st (M1) and 2nd (M2) semester 2024-2025
Year	1
Credits	12 (6+6)
Modular	Yes

Total lecturing hours	72 (36+36)
Total lab hours	72 (36+36)
Total exercise hours	none
Attendance	Suggested, but not required
Prerequisites	none
Course page	https://www.unibz.it/en/faculties/economics-management/bachelor-economics-social-sciences/

Specific educational objectives	The course refers to the basic (M1) and typical (M2) educational activities and belongs to the scientific area of statistics-mathematics (quantitative methods for decision-making). The course is aimed at creating ability to analyze complex economic phenomena by choosing appropriate analytical methods and retrieving the information necessary for implementing the corresponding decision-making processes.

Module 1	Mathematics A for EPE M1
Lecturer	Luciano Marzufero Office BZ I3.06 luciano.marzufero@unibz.it https://www.unibz.it/it/faculties/economics-management/academic-staff/person/49853-luciano-marzufero
Scientific sector of the lecturer	STAT-04/A
Teaching language	English
Office hours	18 hours Cockpit – students' zone – individual timetable Webpage: https://www.unibz.it/en/timetable/?sourceId=unibz&department=26&degree=13141%2C13182
Lecturing assistant	Osatohanmwen Patrick patrick.osatohanmwen@unibz.it

	https://www.unibz.it/it/faculties/economics-management/academic-staff/person/48845-patrick-osatohanmwen
List of topics covered	1. Basic mathematical concepts: sets, relations, functions, numbers, limits, absolute values. 2. Functions of one variable: basic properties, derivatives and their calculus, Taylor approximations, Newton's method. Applications to problems in Economics/Management. 3. Convexity and single-variable optimization (Fermat's rule and sufficient optimality conditions). Applications to problems in Economics/Management. 4. Elements of integration. 5. Basics of probability theory.
Teaching format	Lectures, homework and class exercises

Module 2	Mathematics B for EPE M2
Lecturer	tba
Scientific sector of the lecturer	SECS-S/06
Teaching language	English
Office hours	18 hours Cockpit – students' zone – individual timetable Webpage: https://www.unibz.it/en/timetable/?sourceId=unibz&department=26&degree=13141%2C13182
Lecturing assistant	tba
List of topics covered	tba
Teaching format	Frontal lessons and exercises

Learning outcomes	**<u>Knowledge and understanding</u>** <u>Mathematics A for EPE M1:</u> - Knowledge and understanding of basic mathematical concepts: sets and set operations, relations and their properties, general functions, numbers and elementary equations/inequalities. - Knowledge and understanding of functions of one real variable: basic properties, derivatives and their calculus. - Knowledge and understanding of single-variable optimization problems: optimality notions and conditions, convexity, algorithmic approach. - Knowledge and understanding of integrals for single-variable functions: indefinite integrals, definite integrals and area, integral calculus. - Knowledge and understanding of basics in probability theory: probability measures and random variables, expected value, variance and

standard deviation, distribution functions.
- Knowledge and understanding of the mathematical lexicon in English.

Mathematics B for EPE M2:
Tba

Making judgments

Within the scope of mathematical modelling, students learn to explain the outcome in terms of the corresponding social, scientific or ethical issues.

Communication skills

The course provides skills necessary for a presentation of ideas, problems and solutions based on the acquired mathematical skills to both specialist and non-specialist audiences.

Learning skills

The course creates a base of knowledge and learning skills (acquired through class work, exercises and individual study supervised by the lecturer and teaching assistant) necessary to continue with a high degree of autonomy a further study in economics and management.

Assessment	A written final exam (questions and problems to solve) covering both M1 and M2 parts (M1 partial exam and M2 partial exam, respectively).
Assessment language	English
Evaluation criteria and criteria for awarding marks	Final grade: 50% grade for M1 partial exam, 50% for M2 partial exam. The grades of partial exams are only valid for the academic year in question. They cannot be carried over beyond that time frame.

Required readings	Lecture notes/slides will be provided in due course. Further readings will be announced at the beginning of the course.
Supplementary readings	