Libera Università Internazionale
degli Studi Sociali Guido Carli

LUISS

Syllabus

Academic Year	2022/2023
Program	Business Administration
course	Calculus
Term	I semester
Year	1
SSD	SECS-S/06
Credits	8

INSTRUCTIONAL GOALS	The course aims to provide first-year economics students with the main mathematical tools that are used to analyze and solve a wide range of problems in applied in economics, business, finance and insurance. This will be their first step towards achieving a broad training in quantitative disciplines, as well as a good methodological training for the analysis and critical interpretation of economic and business dynamics. This will allow them to acquire the useful tools for the formulation, implementation and control of decisions in the work contexts in which they will operate.
INTENDED LEARNING OUTCOMES They describe what a learner is expected to know, understand and be able to demonstrate after completion of a learning path.	**Knowledge and understanding**: By the end of the course, students will: • have acquired a wide range of mathematical tools; • be able to understand and solve numerous theoretical and applied problems in economics, business and finance. **Ability to apply knowledge and understanding**: By the end of the course, students will be able to apply quantitative tools to: • business decisions; • the analysis of economic phenomena; • the resolution of economic and business problems in the work contexts in which they will operate. **Autonomy of judgement**: By the end of the course, students will be able to: • develop a critical capacity in identifying the most suitable solution to the proposed problem, even in highly innovative contexts. **Communications Skills**: By the end of the course, students will be able to: • develop communication skills through written papers and oral interviews; • highlight the relationships between the theoretical concepts and the most important economic and managerial applications.

	Learning ability: By the end of the course, students will be able to: • stay up to date; • improve their skills in examining the quantitative aspects of economics and management.
Pre-requisites	• Real numbers; • Powers; • Basic Algebra; • Fractions; • Solving equations and inequalities; • Intervals and absolute values; • Cartesian coordinates; • Second degree equations; • Logic; • Set theory; • Trigonometry; • Exponential and logarithmic functions. Videos and additional materials available on the website learn.luiss.it.
Course content	The mathematical analysis for functions of a single variable allows the students to introduce the fundamental mathematical tools (limits, derivatives, integrals) for the definition and study of the mathematical models in economics. The functions of several variables make it possible to develop models that are closer to economic reality. To this aim, the tools already introduced for the functions of single variable are suitably adapted to the new context. The study of the matrices and the linear systems allows the design of models capable of including large amounts of data. The explanation is accompanied by economic examples to illustrate the importance of the acquired tools in the context of the study program.
Reference Books	Stefan Waner, Steven R Costenoble, Finite Mathematics and Applied Calculus, 7th edition, Cengage.
Teaching Methods	Teaching will include the following activities: • in presence and online teaching; • in presence and online exercise sessions; • material for in-depth study available on the learn.luiss.it page of the course; • work in small groups on specific topics concerning the application of mathematics to economic issues. The details will be published before the start of the course in accordance with the most up-to-date anti-covid provisions.
Assessment	The exam consists of: • 3 intermediate exams (written quizzes) = 50% • Teamwork = 20%. Groups of 4-5 students will be formed. Each group will be given some reference material (textbooks, scientific papers, videos) about applications of mathematics that the students will encounter in the continuation of their study carrier. The group must produce a short-written essay and a 30-minute presentation using PowerPoint slides or other means. Each member of the group must be involved; • Final exam = 30%