



# UNIVERSITÀ DEGLI STUDI DI PALERMO

<b>DEPARTMENT</b>	Scienze Economiche, Aziendali e Statistiche
<b>ACADEMIC YEAR</b>	2023/2024
<b>BACHELOR'S DEGREE (BSC)</b>	ECONOMICS, INTERNATIONAL COOPERATION AND SUSTAINABLE DEVELOPMENT
<b>SUBJECT</b>	MATHEMATICS FOR SOCIAL SCIENCES
<b>TYPE OF EDUCATIONAL ACTIVITY</b>	C
<b>AMBIT</b>	10713-Attività formative affini o integrative
<b>CODE</b>	22582
<b>SCIENTIFIC SECTOR(S)</b>	SECS-S/06
<b>HEAD PROFESSOR(S)</b>	PECORELLA ANTONIO Professore Associato Univ. di PALERMO
<b>OTHER PROFESSOR(S)</b>	
<b>CREDITS</b>	6
<b>INDIVIDUAL STUDY (Hrs)</b>	94
<b>COURSE ACTIVITY (Hrs)</b>	56
<b>PROPAEDEUTICAL SUBJECTS</b>	
<b>MUTUALIZATION</b>	BASIC MATHEMATICAL AND DIGITAL KNOWLEDGE - Corso: TURISMO, TERRITORI E IMPRESE BASIC MATHEMATICAL AND DIGITAL KNOWLEDGE - Corso: TOURISM, TERRITORIES AND BUSINESSES
<b>YEAR</b>	1
<b>TERM (SEMESTER)</b>	1° semester
<b>ATTENDANCE</b>	Not mandatory
<b>EVALUATION</b>	Out of 30
<b>TEACHER OFFICE HOURS</b>	<b>PECORELLA ANTONIO</b> Monday 15:00 17:00 Tuesday 15:00 17:00 Wednesday 15:00 17:00

<b>PREREQUISITES</b>	Elementary equations and inequalities: linear, quadratic and higher grade. Hints on numerical sets.
<b>LEARNING OUTCOMES</b>	<p>Knowledge and understanding: acquisition of functional calculus, limits calculus, differential and integral calculus for real functions of a real variable, linear algebra elements, power series. Applying knowledge and understanding: ability to handle mathematical formalism: from a real operating environment to a theoretical framework in which variables are used to solve problems and to model real situations. Ability to use abstract concepts and models for concrete situations.</p> <p>Making judgements: being able to assess the potential and the limits of the available analytical tools to the applied disciplines. Communication: being able to relate topics addressed by using logical and formal languages correctly.</p> <p>Lifelong learning skills: developing the learning capacities needed to undertake advanced studies with a high degree of autonomy.</p>
<b>ASSESSMENT METHODS</b>	<p>The first-year students can sit for the "MID-TERM TEST", which focuses on the topics covered to date. It consists of a 3-question written test and a possible oral test. Each of the three questions begins with a number in bold given in square brackets, which indicates its value.</p> <p>The sum of the scores of the three questions is 15.</p> <p>The minimum score to pass the "MID-TERM TEST" is 9 (half of 18).</p> <p>The students who score a grade greater than or equal to 9 can accept the grade without taking any oral test. They could sit for an oral exam if the grade were lower than 15.</p> <p>At the end of the term, those who pass the midterm test can sit for a second test based on the remaining part of the program. The second test consists of 3 questions whose sum of the scores is 15 as well. Also in this case, the minimum score to pass is 9, and students could ask to sit for an oral exam. Those who failed the first midterm test or wish to deal with the entire subject through a single written test will have to ask to sit for the COMPLETE test based on six questions, which requires a maximum grade of 30. Obviously, the time allotted for the complete test is doubled compared to that assigned for each of the two midterm tests. Also for the complete test, it is expected that a first-year student who has achieved a grade greater than or equal to 18 can sit for the oral test based on the entire program.</p> <p>The overall assessment, expressed in thirtieths, is articulated as follows:</p> <p>30-30 laude if the student demonstrates excellent knowledge of the topics, excellent command of the language, good analytical skills and connection between the various issues.</p> <p>26-29 if the student demonstrates command of the topics but uncertainties in technical language</p> <p>23-25 if the student demonstrates good knowledge of the main issues but uncertainties in the technical language</p> <p>18-22 if the student demonstrates minimal knowledge of topics and inaccurate and crass technical language.</p> <p>INSUFFICIENT if the student demonstrates severe deficiencies in expressing the basic arguments</p>
<b>EDUCATIONAL OBJECTIVES</b>	The lectures continue, make uniform, and extend the knowledge acquired in under graduate studies. The primary goal is developing the ability to critically examine the mathematical concepts already acquired. The second goal is the acquisition of more advanced mathematical methods and oriented toward understanding and the use of formal descriptions to model economic and social processes.
<b>TEACHING METHODS</b>	Face-to-face lectures: 32 hours. In-class exercises: 24 hours.
<b>SUGGESTED BIBLIOGRAPHY</b>	<p>Tutti gli argomenti vengono trattati nelle dispense fornite dal docente, reperibili su TEAMS (da concordare durante il corso)</p> <p>Lo studente che vuole puo' avvalersi di uno di questi testi per approfondimenti</p> <ul style="list-style-type: none"> <li>• Angelo Guerraggio, Matematica, Pearson Editore, Torino.</li> <li>• Ferrarotti, Appunti di Algebra Lineare, disponibile on-line</li> </ul> <p>Per la preparazione su concetti di base puo' utilizzare il seguente libro di precorso:</p> <ul style="list-style-type: none"> <li>• Antonio Pecorella, Conigliaro Maria, Lacagnina Valerio, Precorso di Matematica Generale. Editore PEARSON</li> </ul> <p>Sempre in modo facoltativo si possono reperire ulteriori approfondimenti su:</p> <ul style="list-style-type: none"> <li>• Cristina Di Bari, Pasquale Vetro, Analisi matematica con elementi di calcolo numerico, Vol 1 e 2, Libreria Dante Palermo (disponibili in biblioteca di Dipartimento)</li> <li>• Giorgio Giorgi, Elementi di matematica, Giappichelli Editore.</li> </ul> <p>Per le esercitazioni si consiglia il testo (ma non e' obbligatorio):</p>

• P. Marcellini, C. Sbordone, Esercitazioni di Matematica, Vol. I e II, Liguori Editore.

## SYLLABUS

<b>Hrs</b>	<b>Frontal teaching</b>
2	Set theory: numerical sets, set operations, set of parts of a set, Cartesian product, partition of a set, algebra of sets, relations and elementary functions.
2	The Logic of proofs
2	Numeric ensembles
2	Properties of real. numbers
2	The function
6	Limits of a function
4	Derivatives of a function.
4	Fundamental theorems of differential calculus.
2	Matrix algebra.
2	Determinant matrix.
4	Linear equations systems.
<b>Hrs</b>	<b>Practice</b>
24	In-class exercises on all subjects of face to face lecturers: 2 hrs for logic, 6 hrs for function, 4 hrs for limits, 4 hrs for derivatives, 4 hrs for matrices and detereminants, 4 hrs for linear equations system.