

General information	
Academic subject	<i>Elementary Mathematics from an Advanced Point of View</i>
Degree course	<i>Mathematics</i>
Academic Year	<i>Optional teaching</i>
European Credit Transfer and Accumulation System (ECTS)	7
Language	<i>Italian</i>
Academic calendar (starting and ending date)	<i>First semester</i>
Attendance	<i>No</i>

Professor/ Lecturer	
Name and Surname	Michele Giuliano Fiorentino
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Telephone	/
Department and address	<i>Department of Mathematics - UNIBA</i>
Virtual headquarters	<i>TEAMS code: go5m0k8</i>
Tutoring (time and day)	Tuesday 11.30-13.00 (The teacher also receives on other days by agreeing the appointment via email)

Syllabus	
Learning Objectives	<i>The course aims to consider related geometric and algebraic topics in a structured view from a theoretical point of view. A discussion of geometry through the use of the vector structure of space and geometric transformations in their axiomatic approach will be accompanied by the reading of this mathematical treatment in reality.</i>
Course prerequisites	<i>Knowledge of Euclidean Geometry; knowledge required in the courses of Geometry of a degree course in Mathematics of the class L-35. In particular, concepts of Transformation Group and Vector Space</i>
Contents	<i>The role of geometry in the teaching of mathematics in pre-university schools: problems and perspectives. Klein's Erlangen program and the geometry of transformations. The geometry of space according to the axiomatics of G. Choquet: Axioms of incidence; lines and planes in the space; Parallelism; Ordering axioms; Axioms of metric structure; Properties. Real vector space structure of a line. The group of isometries and similes of a straight line. The group of isometries and similes of a plane. Angles and their properties; Real vector space structure of a plane. Group of the similes of a plane. Field structure on one plane. Similarity criteria. The group of isometries in space. Perpendicularity in space. Real vector space structure in space.</i>
Books and bibliography	<i>Slides and materials by the teacher. Choquet, G., L'insegnamento della Geometria, Ed. Feltrinelli. Linati, P., L'algoritmo delle occasioni perdute, Ed Erickson, Trento. Villani, V., Cominciamo dal punto, Pitagora Editrice, Bologna.</i>
Additional materials	

Work schedule			
Total	Lectures	Hands on (Laboratory, working groups, seminars, field trips)	Out-of-class study hours/ Self-study hours
Hours			



60	52	8	115
ECTS			
7	6,5	0,5	
Teaching strategy			
		<ul style="list-style-type: none"> - <i>Frontal lesson</i> - <i>Laboratory activities</i> 	
Expected learning outcomes			
Knowledge and understanding on:		o Possession and knowledge of Geometry based on an axiomatic treatment directed towards the algebraic structure of the plane and space	
Applying knowledge and understanding on:		<ul style="list-style-type: none"> o Analyze and become aware of the course contents. o Read, interpret and analyze research articles on the topics of the course, demonstrating the ability to grasp, evaluate and use the results of empirical studies in order to build knowledge and improve interventions. 	
Soft skills		<ul style="list-style-type: none"> • Autonomy of judgment <ul style="list-style-type: none"> o Understanding the relationships between the various structures studied and knowing how to make the most appropriate choices with respect to the objectives set • Communication skills <ul style="list-style-type: none"> o Communicate and argue mathematical concepts with clarity and relevance, with formulations suited to the target audience. o Be able to draw conclusions accurately in both written and oral form • Ability to learn independently <ul style="list-style-type: none"> o Acquire a flexible mentality, capable of abstracting and relating different formal theories, rapidly acquiring the necessary specific skills. 	
Assessment and feedback			
Methods of assessment		<i>Evaluation of the activities proposed during the course and final oral exam</i>	
Evaluation criteria		Learning will be assessed at various levels, through the final oral exam, and possibly exercises administered during the course. The student will have to demonstrate mastery in the use of mathematical concepts, the relationships between the different structures studied, communicate and argue clearly.	
Criteria for assessment and attribution of the final mark			
Additional information			