



General information		Academic year 2022-2023
Academic subject	Foundations and Mathematics Education for the Integrated Sciences	
Degree programme	Mathematics (LM-35)	
Programme year	Third	
Term	Second semester (February 27, 2023 – May 26, 2023)	
European Credit Transfer and Accumulation System credits (ECTS)	Es.: 7	
Language	Italian	
Attendance	Not compulsory	

Lecturers		
Name and surname	Eleonora Faggiano (instructor of record)	Cinzia Elia
E-mail	eleonora.faggiano@uniba.it	cinzia.elia@uniba.it
Telephone	+39 080 544 2668	+39 080 544 2685
Department and office	Department of Mathematics, room 4 second floor	Department of Mathematics, room 7 third floor
Virtual meeting room	Microsoft Teams code z2jc00r	Microsoft Teams code z2jc00r
Web page	<a href="https://www.dm.uniba.it/members/faggiano">https://www.dm.uniba.it/members/faggiano</a>	<a href="https://www.dm.uniba.it/members/elia">https://www.dm.uniba.it/members/elia</a>
Office hours	To be agreed with the teacher by e-mail	To be agreed with the teacher by e-mail

Syllabus	
<b>Learning objectives</b>	The course aims to provide basic content related to the teaching of mathematics in middle and high school. The course provides an in-depth study of the content from the historical epistemological and educational perspectives. Starting with the national curriculum guidelines and the national and international standardized tests (INVALSI, PISA et al.), it pays special attention to the analysis of the epistemological nodes of the discipline, presenting the results of established studies and shared good practices in mathematics education.
<b>Course prerequisites</b>	Knowledge that is typically acquired in the first two years of courses in an L-35 degree program.
<b>Course contents</b>	Mathematics curricula in secondary school. Insights related to the learning objectives of the various thematic cores: numbers, space and figures, relationships and functions, data and predictions, proof and proving. Methodological insights concerning the mathematics laboratory and the assessment.
<b>Reference books</b>	To be defined
<b>Additional course materials</b>	Indications relating to the reference texts and any additional supporting materials will be provided during the course.

Work schedule				
	Total	Lectures	Hands-on learning (recitations/laboratories /seminars/other)	Self-study
<b>Hours</b>	56	56	0	119
<b>ECTS credits</b>	7	7	0	

Teaching methods	
	The course will be mainly delivered in frontal teaching (in blended mode in

	case there are requests from students). Group work will be organized during the hours of laboratory practice and in some moments dedicated to the critical analysis of some contents and the preparation of the paper that will be discussed during the oral interview.
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Expected learning outcomes	
<b>Knowledge and understanding</b>	<ul style="list-style-type: none"> <li>○ Expand the basic knowledge of the Bachelor's Degree, developing abstraction skills and mastery of the scientific method</li> <li>○ Acquire a theoretical and historical-cultural preparation necessary for teaching mathematics</li> <li>○ Critically analyse the course contents</li> </ul>
<b>Applying knowledge and understanding</b>	<ul style="list-style-type: none"> <li>○ Be able to describe specific topics of study and popular expositions</li> <li>○ Develop autonomously examples of didactic activities for secondary school</li> <li>○ Discuss different points of view on educational applications of course content</li> </ul>
<b>Making judgements</b>	<ul style="list-style-type: none"> <li>○ Reflect on the change in mathematical methodologies and tools throughout history.</li> <li>○ Initiate research activities on specific issues and investigate new problems in groups and independently.</li> </ul>
<b>Communication skills</b>	<ul style="list-style-type: none"> <li>○ Ability to present mathematical arguments with clarity and accuracy and in forms appropriate to the recipients</li> </ul>
<b>Learning skills</b>	<ul style="list-style-type: none"> <li>○ Develop a flexible and analytical mentality that allows to independently identify which knowledge to deepen and to be acquired for the management of a problem in the mathematical field, in the teaching of mathematics and also in other working areas</li> </ul>

Assessment and feedback	
Assessment methods	Learning assessment will take place by means of an oral interview during which a written paper, to be delivered within 5 days before the exam, will also be discussed. The subject of the paper will be agreed during the course or in any case before the exam.
Evaluation criteria	<ul style="list-style-type: none"> <li>• <i>Knowledge and understanding:</i> <ul style="list-style-type: none"> <li>○ Knowledge of the contents and of the specialized vocabulary</li> <li>○ Critical reasoning skills on the course contents</li> </ul> </li> <li>• <i>Applying knowledge and understanding:</i> <ul style="list-style-type: none"> <li>○ Ability to correctly and adequately expose the topics to the addressees</li> <li>○ Ability to design teaching applications related to the course contents</li> </ul> </li> <li>• <i>Making judgements:</i> <ul style="list-style-type: none"> <li>○ Ability to analyse the change in mathematical methodologies and tools over the course of history</li> <li>○ Ability to analyse didactic applications related to the course contents</li> </ul> </li> <li>• <i>Communication skills:</i> <ul style="list-style-type: none"> <li>○ Quality of exposure with respect to different types of addressees and in terms of competence in the use of the specialist vocabulary</li> </ul> </li> <li>• <i>Learning skills:</i> <ul style="list-style-type: none"> <li>○ Ability to independently identify which knowledge to deepen and to acquire for the management of a problem in the mathematical field, in the teaching of mathematics and also in other work areas</li> </ul> </li> </ul>
Grading policy	The final grade will be awarded taking into account the evaluation criteria at the end of a written task and an oral interview on the course contents



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Additional information	