UNIVERSITÀ DEGLI STUDI DI BARI ALDO MORO

CONSIGLIO INTERCLASSE IN MATEMATICA

COURSE OF STUDY THREE-YEAR BACHELOR PROGRAMME IN MATHEMATICS

ACADEMIC YEAR 2023-2024

ACADEMIC SUBJECT FOUNDATIONS AND MATHEMATICS EDUCATION FOR THE INTEGRATED SCIENCES

General information	
Programme year	Third
Term	Second semester (February 26, 2024 – May 31, 2024)
European Credit Transfer and Accumulation System credits (ECTS)	7
SSD	MAT/04 – Complementary Mathematics
Language	Italian
Mode of attendance	Not mandatory

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		
Web page	https://www.dm.uniba.it/it/members/faggiano	https://www.dm.uniba.it/it/members/elia
Office hours		

Work schedule	Total	Lectures	Hands-on learning (recitations)	Self-study
Hours	175	48	15	112
ECTS credits	7	6	1	

Learning objectives	
	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 focuses on the analysis of the epistemological nodes of the discipline, presenting the results of established studies and shared good practices in mathematics education. Special attention is paid to probability calculation and statistics.

Course prerequisites	
	Knowledge that is typically acquired in the first two years of courses in an L-35 degree program.

Syllabus

Course contents	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.
Reference books	To be defined
Additional course materials	Indications relating to the reference texts will be provided during the course.
Repository	Any additional supporting materials will be provided during the course.

Expected learning outcomes	
Knowledge and understanding	○ Expand the basic knowledge of the Bachelor's Degree, developing abstraction skills and mastery of the scientific method ○ Acquire a theoretical and historical-cultural preparation necessary for teaching mathematics ○ Critically analyse the course contents
Applying knowledge and understanding	○ Be able to describe specific topics of study and popular expositions ○ Develop autonomously examples of didactic activities for secondary school ○ Discuss different points of view on educational applications of course content
Soft skills	*Making judgements*: Reflect on the change in mathematical methodologies and tools throughout history; Initiate research activities on specific issues and investigate new problems in groups and independently.
	Communication skills: Ability to present mathematical arguments with clarity and accuracy and in forms appropriate to the recipients
	Learning skills: 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

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.

Assessment	
Assessment methods	Learning assessment will take place by means of a written task and a subsequent oral interview
Evaluation criteria	• *Knowledge and understanding*: ○ Knowledge of the contents and of the specialized vocabulary ○ Critical reasoning skills on the course contents • *Applying knowledge and understanding*: ○ Ability to correctly and adequately expose the topics to the addresses ○ Ability to design teaching applications related to the course contents • *Making judgements*: ○ Ability to analyse the change in mathematical methodologies and tools over the course of history ○ Ability to analyse didactic applications related to the course contents • *Communication skills*: ○ Quality of exposure with respect to different types of addressees and

	in terms of competence in the use of the specialist vocabulary • *Learning skills*: 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
Grading policy	The final grade will be awarded taking into account the assessment criteria at the end of a written test and an oral interview on the course content. To pass the written test, the student must be able to correctly complete the proposed exercises on the main topics of the syllabus or at least part of them. Each exercise in the written test is given a mark and the test is passed if the final mark is greater than or equal to 18/30. The assessment of the written test is based on the achievement of the learning aims. After passing the written test, the student takes the oral interview, which is passed if the final mark is greater than or equal to 18/30. The student must show mastery of the language, methodological rigour and that he/she has acquired the fundamental notions and concepts of the course. Assessment is based on the achievement of the intended learning aims. To achieve a high grade the student must have developed autonomy of judgement and adequate argumentation and communication skills. The written test and the oral interview are of equal value. The examination is passed if both are passed. The final examination mark expresses the overall assessment. It is awarded in thirtieths and the examination is deemed passed if the final mark is greater than or equal to 18/30. Honours are awarded in the event of further study of some arguments in the programme.

Further information	