



UNIVERSITÀ  
DEGLI STUDI DI MILANO-BICOCCA

## SYLLABUS DEL CORSO

### Istituzioni e Didattica della Matematica - 1

2324-2-G8501R012-G8501R012M-T1

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#### Course title

G8501R012 -- ISTITUZIONI E DIDATTICA DELLA MATEMATICA CON LABORATORIO

#### Topics and course structure

The aim of the course is to give students a good knowledge – through lectures, exercise sessions and laboratories – of the foundations of mathematics as it is taught in primary school or in the pre-mathematical activities of kindergarten, completing the necessary background in order to teach mathematics effectively and suggesting some ways through which the teaching can unfold. We will focus particularly on themes in geometry.

Topics will include:

- elements of euclidean geometry;
- measure and proportionality;
- elements of the geometry of transformations (in particular similarities and isometries);
- constructions on graph paper;
- introduction to Problem-Based Learning and Problem-Solving.

This list might be supplemented by the instructor with topics available in the reference texts.

#### Objectives

After completing the course the student should be able to

- understand basic concepts of arithmetic and geometry;
- demonstrate skill in mathematical reasoning and in explaining mathematical procedures and results;
- describe the role of problem-solving in mathematics teaching.

## Methodologies

Lectures, exercise sessions and laboratories (compulsory laboratory).

## Online and offline teaching materials

<http://elearning.unimib.it/>

## Programme and references

Reference text:

- M. Cazzola, *Matematica per scienze della formazione primaria*, Carocci, 2017.
- Euclid, *Elements Book 1*

Further readings:

- AAVV, *Conorovesciato: un esperimento di didattica per problemi nella scuola primaria*, Materiale per i Quaderni a Quadretti, Mimesis, Milano, 2007.
- M. Dedò, *Galleria di metamorfosi*, Quaderni a Quadretti, Mimesis, 2010.
- M. Cazzola, *Per non perdere la bussola*, Quaderni a Quadretti, Decibel/Zanichelli, Bologna, 2001.
- Euclides, *Les éléments, Extraits des livres I, II et VI, Textes choisis, présentées et commentés par André Deledicq, Les éditions du KANGOUROU*, 2011 (or any other edition of Euclides' Elements).
- A. Millan Gasca, *All'inizio fu lo scriba*, Quaderni a Quadretti, Mimesis, Milano, 2004.
- V. Villani, *Cominciamo dal punto*, Pitagora, 2006.
- G. Polya, *La scoperta matematica*, vol 1 e 2, Feltrinelli, Milano.

## Assessment methods

A computerized preliminary test (with closed-ended questions), a written test (with open-ended exercises and open-ended questions) and an oral test

(which concerns the topics covered in class), all aimed at verifying the knowledge and skills acquired, as described in the points "Topics and structure of the course" and "Objectives".

## Office hours

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## **Programme validity**

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## **Course tutors and assistants**

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## **Sustainable Development Goals**

QUALITY EDUCATION

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