UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Basic Mathematics for Teaching - 2

2324-2-G8501R012-G8501R012M-T2

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, algebra 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
-Six exercise e-learning sessions of two hours in small goups. To participate in the exercises, it is mandatory to register for one of the groups on the e-learning platform.

- Pedagogical-didactic laboratory (the course includes a pedagogical-didactic laboratory with compulsory attendance).

Online and offline teaching materials

Reference books.
Online: interactive exercises on the wims platform and exercises for pen and paper resolution available on the e-learning page of the course
http://elearning.unimib.it/

Programme and references

Reference text:

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

Teaching materials:

- AAVV, *Conorovesciato: un esperimento di didattica per problemi nella scuola primaria*, Materiale per i Quaderni a Quadretti, Mimesis, Milano, 2007.

Further readings:

- 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 éeditions 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 preliminary computerized test (with open-ended questions and closed-ended questions), a written test (with open-ended exercises) and an oral test, all aimed at verifying the knowledge and skills acquired, as described in the points **Topics and structure of the course** and **Objectives**.

Office hours

By appointment, writing an email to milvia.rossini@unimib.it

Programme validity

two academic years

Course tutors and assistants

Sustainable Development Goals

QUALITY EDUCATION