UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Basic Mathematics for Teaching (with Workshop)

2425-2-G8501R012

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 49 hours, Delivered Didactics (24 2-hours lectures and one 1-hour lecture, in presence).
-Six exercise e-learning sessions of two hours in small goups in interactive teaching.

- Pedagogical-didactic laboratory in interactive teaching (the course includes a pedagogical-didactic laboratory with compulsory attendance in presence, 3 4-hours meetings).

Online and offline teaching materials

Reference books.
Online: interactive exercises on the wims platform and exercises for pen and paper resolution available on the wims page of the course.

Programme and references

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Erasmus
Erasmus students may choose to write the part of the exam which is on paper (open question/exercise), and the oral examination, in English.The programme is the same as for non-Erasmus students.

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

The **profit examination** aims to assess the knowledge and skills acquired, as described in the sections **Topics**, **Course Structure**, and **Objectives**.

The exam consists of a written test and a possible oral examination.

The written test includes an initial computerized section with automatic grading, consisting of a series of exercises to be completed on the WIMS platform. Candidates who score **12/18 or higher** advance to the second **paper-and-pen section** (open-ended exercises).

- The final grade for the written exam is composed as follows: **12/30** from the paper-based section and **18/30** from the WIMS test.
- The written exam is considered passed with a score of **18 or higher**.
- Candidates scoring **between 18 and 21** (inclusive) must take a mandatory oral exam.
- Candidates scoring **22 or higher** in the written test may opt for an oral exam.
- The oral exam is required whenever requested by the instructor or the student.

Evaluation Criteria
Answers are assessed based on accuracy, completeness, and the ability to explain and justify solutions with clarity and precision.

Evalutazion table
An evaluation table (in Italian) is found [here](https://elearning.unimib.it/mod/resource/view.php?id=1399179(https://)

Office hours

By appointment, writing an email to the teacher.

Programme validity

two academic years

Course tutors and assistants

Sustainable Development Goals

QUALITY EDUCATION | REDUCED INEQUALITIES