UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Basic Mathematics For Teaching - 1

2122-2-G8501R012-G8501R012M-T1

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:

- numbers and basic concepts in algebra
- 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, exercise sessions and laboratories (compulsory laboratory).

Online and offline teaching materials

http://elearning.unimib.it/

Programme and references for attending students

Reference text:

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

Programme and references for non-attending students

Same as for attending students.

Assessment methods

Written and oral exams

Office hours

Programme validity

Course tutors and assistants
