



UNIVERSITY OF NICOSIA ΠΑΝΕΠΙΣΤΗΜΙΟ ΛΕΥΚΩΣΙΑΣ

University of Nicosia, Cyprus

Course code EDUE-331	Course title Μαθήματος Teaching Primary school Mathematics	ECTS Credits 6
Department Pedagogical studies	Semester Fall/Spring	Prerequisites EDUE-131
Type of Course Required	Field Mathematics	Language of Instruction Greek
Level of Course Undergraduate	Year of Study 3 rd	Lecturer Dr George Philippou
Mode of Delivery face-to-face	Work Placement N/A	Co-requisites None
Recommended Optional Programme Components: N/A		

Objectives of the course:

The aim of this course is to facilitate students to acquire the basic theoretical and practical knowledge for teaching mathematics to primary students. More specifically, the objectives of the course are to help students become able to:

- Define, discuss, and analyse the aims and objectives of mathematics education at the primary school.
- Describe, analyse and apply the basic learning theories with regard to teaching primary mathematics.
- Analyse and apply modern methods of teaching mathematics and particularly of topics such as: number concepts and operations, concepts of space and geometry, measurement, motives and pre-algebra concepts, data analysis and statistics.
- Describe, analyse and apply processes for developing mathematical thinking such as: problem solving and problem posing, communication in and with mathematics, mathematical reasoning/proof, use of various representations, etc.
- Describe, analyse and apply principles and methods educational evaluation – of the learning process and students' performance in mathematics.

Learning outcomes:

By the end of the course the students are expected to become able to:

- Describe the significance of mathematics in the contemporary technological society.
- Describe the aims and objectives of teaching primary school mathematics.
- Describe the content and the processes of the primary mathematics curriculum.
- Prepare and apply long and a short term teaching plans, i.e., weekly and daily lesson plans, including all necessary steps from defining the specific objectives, through the appropriate activities to the evaluation.
- Apply didactical procedures suitable for the various concepts and operations in the primary mathematics curriculum.
- Describe and apply several means and methods for the evaluation of the learning process and students' performance in mathematics.

Content of the course:

During the class sessions the following topics will be presented, analysed and discussed:

- The primary school mathematics curriculum. Aims and objectives, and the content and the processes.
- Recent emphases in the teaching of mathematics.
- Learning theories (behaviourism, gestalt, constructivism, etc.) and their consequences in the teaching of mathematics.
- Methods and forms of teaching mathematics. Developing lesson plans.
- Problem solving and problem posing (on the basis of a given problem, from specific data, from an open situation, etc.).
- Conceptualising the natural number. Number systems – place value etc. Number operations.
- The fraction concept. Fraction equivalence, fraction comparison and fraction operations. Decimal numbers, ratio and proportion.
- Elementary geometrical figures and their properties.
- Measurement of: length, area, volume, etc.
- Evaluation methods in mathematics.

Teaching methods

Presentation by the instructor, discussions, presentation of lesson plans by students, presentation of teaching mathematics concepts by students.

Evaluation

Class participation and home work, Written midterm examination, Development and presentation of lesson plan and lesson study, Written final examination.

Bibliography

Basic book

Philippou, G. N. & Christou, C. (2004). *Didactics of mathematics*. Athens: George Dardanos (in Greek).

Supplementary reading

Toumasis, M. (2000). *Contemporary Didactics of Mathematics*. Athens: Gutenberg (in Greek).

Christou, C. Papanastasiou, C. & Philippou, G. N. (2003). *TIMSS, Results of Cypriot primary school students*. Nicosia: University of Cyprus (in Greek).

Department of curriculum development. Ministry of Education and Culture, Cyprus

English, L. (1997). *Mathematical Reasoning: Analogies, metaphors and images*. Mahwah, N.J.: Lawrence Erlbaum Associates.

Hiebert, J. (1986). *Conceptual and procedural knowledge. The case of mathematics*. Hillsdale, NJ: Lawrence Erlbaum. Hiebert, J., & Behr, M. (1988). *Number concepts and operations in the Middle Grades*. Reston: VA, NCTM.

Lamon, S. (1999). *More: in-depth discussion of the reasoning activities in "Teaching fractions and ratios for understanding"*. Mahwah, NJ: Erlbaum.

Lamon, S. (1999). *Teaching fractions and ratios for understanding: essential content knowledge and instructional strategies for teachers*. Mahwah, NJ: Erlbaum.

National Council of Teachers of Mathematics (2000). *Principles and standards for school mathematics*. Reston: VA, NCTM.

Pólya, G. (1945). *How to Solve It*. Princeton: Princeton University Press.

Ryan, J., & Williams, J. (2007). *Children's Mathematics 4-15: Learning from Errors and Misconceptions*. Berkshire: Open University Press.

Charles, R., & Silver, E. (1989). *The Teaching and Assessing of Mathematical Problem Solving*. Reston: VA, NCTM.

Journals: Arithmetic Teacher, Mathematics Teacher, Teaching Children Mathematics, Teaching Mathematics in the Middle Grades, Euclid C'.

From the Internet

NATIONAL LIBRARY OF VIRTUAL MANIPULATIVES

<http://nlvm.usu.edu/>

MINISTRY OF EDUCATION

Mathematics Textbooks:

<http://www.pi.ac.cy/dnn/yap/ΕκδόσειςΥΑΠ/tabid/165/Default.aspx>

http://www.pi.ac.cy/pi/index.php?option=com_content&view=article&id=73&Itemid=134&lang=el

Other materials:

<http://www.schools.ac.cy/klimakio/index.html>

<http://www.schools.ac.cy/klimakio/index.html>

Lesson plans for the teaching of mathematical concepts, electronic manipulatives, etc.

Pedagogical Institute of Greece

<http://www.pi-schools.gr/>

Primary school mathematics books

**NATIONAL COUNCIL OF TEACHERS OF
MATHEMATICS** <http://www.nctm.org/>

Lesson plans for the teaching of mathematics electronic materials and activities

THE NATIONAL STRATEGIES

<http://nationalstrategies.standards.dcsf.gov.uk/primary/>

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