University of Nicosia, Cyprus

Course Code	**Course Title**	**ECTS Credits**
EDUE-231	Problem Solving	6
Department	**Semester**	**Prerequisites**
Pedagogical Studies	Fall	None
Type of Course	**Field**	**Language of Instruction**
Elective	Mathematics	Greek
Level of Course	**Year of Study**	**Lecturer(s)**
1st Cycle	2nd	Dr Nicholas Mousoulides
Mode of Delivery	**Work Placement**	**Co-requisites**
face-to-face	N/A	None
Recommended Optional Programme Components: N/A		

Course Objectives:

The purpose of this course is to increase teachers' abilities to use knowledge and experience when encountering new and unexpected situations. The course aims to assist teachers in developing higher level thinking skills, and in learning to formulate, analyze, and model problems, choosing relevant information, making conjectures, devising plans and testing solutions.

The course also aims to familiarize teachers with the objectives of problem solving at the elementary school curricula and to provide them with opportunities to develop problem solving activities for elementary school students.

Learning Outcomes

Upon completing the course students should be able to:

- Demonstrate improved knowledge about problem solving in the mathematics curriculum, by:
  - differentiating between problems and exercises in mathematics
  - explaining the different roles that different types of problems play in the curriculum
  - identifying factors that affect problem difficulty and problem-solving performance
  - describing the role of problem solving in generating mathematics

- Demonstrate improved mathematical thinking, by:
  - tackling questions and discussing them
  - reflecting on their actions
  - Monitoring and evaluating students' problem solving skills.

- Solve a variety of problems, appropriate for the elementary school students, by employing a variety of strategies and processes and by using contemporary technological tools.
- Model complex problems and develop solutions, following iterative cycles of improvement.

Course Content

1. A historical perspective of problem solving
2. Problem solving and affect
3. Teacher role in problem solving
4. Problem solving strategies
5. Mathematical modeling and problem solving
6. Problem solving and contemporary technological tools

Learning Activities and Teaching Methods:

Lecture, individual and group work, lab work, student presentations

Assessment Methods:

Formative assessment (Midterm and Final Exams), Collaborative work, Presentations, Discussions

Required textbooks/reading:

Koleza, E. (2010). *Theory and Applications in the Teaching of Mathematics*. Athens: Topos.

Recommended Textbooks/Reading:

Mason, J., Burton, L., & Stacey, K. (2010). *Thinking Mathematically (2nd Ed.)*. Prentice Hall.

Schoenfeld, A. (1994). *Mathematical Thinking and Problem Solving*. Lawrence Erlbaum.