Module/Course Title: Design and Assessment of Educational Material in the Didactics of Mathematics and Science

- **Name of lecturer:** Michael Skoumios

- **Content outline:**
  Following topics will be covered in this course: (a) new perspectives in mathematics and science education, (b) mathematics and scientific literacy, (c) mathematics and science practices, crosscutting concepts, core ideas in mathematics and science and “three dimensional” learning, (d) students’ conceptions about mathematics and science concepts, (e) mathematics and science teaching approaches, (f) constructivist learning in mathematics and science, (g) inquiry-based learning in mathematics and science, (h) design strategies for developing mathematics and science instructional materials, (i) mathematics and science education and interdisciplinary approaches, (j) developing mathematics and science instructional materials, and (k) assessing mathematics and science instructional materials.

- **Learning outcomes (200-500 words):**
  The purpose of this course is the systematic conformation of design, creation, use and evaluation procedures of instructional tools and learning materials for mathematics and science. At the end of the course students should be able to: (a) report the new perspectives in mathematics and science education, (b) analyse the historical and contemporary meanings of mathematics and scientific literacy and their relationship to mathematics and science education reforms, (c) identify the mathematics and science practices, the crosscutting concepts, the core ideas in mathematics and science and analyse the meaning of the term “three dimensional” mathematics and science learning, (d) report and analyse the research-based claims relating to students’ conceptions about mathematics and science concepts and describe the main features of students’ conceptions, (e) identify and analyse the approaches for mathematics and science teaching, (f) explain the basic principles of constructivist learning in mathematics and science, (g) analyse the meaning of inquiry-based learning in mathematics and science and identify its essential features, (h) report and analyse design strategies for developing mathematics and science instructional materials, (i) discuss about science education and interdisciplinary approaches, (j) design and develop mathematics and science instructional materials, and (k) assess mathematics and science instructional materials.
• **Recommended Reading:**

  **a) Basic Textbooks:**

  **b) Additional References:**

• **Learning Activities and Teaching Methods:**
  Seminar-type lesson / teamwork.

• **Assessment/Grading Methods:**
  Written work (50%) and oral exams (50%).

• **Language of Instruction:**
Greek.

- **Mode of delivery (face-to-face, distance learning):**
  Face-to-face.