TOPICS IN OPERATIONS RESEARCH AND DECISION SYSTEMS

- **Course code**
  8144
- **Type of course (compulsory, optional)**
  Elective (compulsory course for both “Operations Research and Management Science” and “Operations and Supply Chain Management” streams
- **Level of course** (e.g. first, second or third cycle; sub-level if applicable)
  N/A
- **Year of study**
  2013-2014
- **Semester**
  6th semester
- **Number of credits allocated**
  6 ECTS Credits
- **Name of lecturer**
  Christos D. Tarantilis, Full Professor
- **Learning outcomes**
  This course introduces advanced optimization tools and techniques with the main emphasis being on the application of computational intelligence algorithms to different problems and cases which arise in business and industry, such as vehicle routing and scheduling problems, packing problems, facility location and layout problems, project scheduling with resource constraints problems, workforce and manpower scheduling problems, timetabling problems, machine scheduling problems, port logistics problems, telecom problems, waste management problems, health care problems, maritime and shipping problems.
  On completion of this course, students should be able to:
  - broaden their exposure to computational methodologies;
  - analyze and design effective computational intelligence algorithms for complex business problems;
  - provide examples and cases of how the computational intelligence algorithms can be used to solve real-life problems.
- **Mode of delivery (face-to-face, distance learning)**
  Face-to face teaching
- **Prerequisites and co-requisites**
  N/A

- **Recommended optional programme components**

  N/A

- **Course contents**

  The course material includes the following thematic areas:

  - Threshold accepting algorithms
  - Tabu search algorithms
  - Swarm Intelligence and Ant colony optimization
  - Evolutionary computation and genetic algorithms
  - Scatter search and path relinking
  - Decision support systems and computational intelligence algorithms
  - Examples and real life applications

- **Recommended or required reading**

  📖 Tarantilis CD (2013). “Topics in Operations Research and Decision Systems”, DMST Eduportal, AUEB (in Greek).

  📖 Doerner KF, Gendreau M, Greistorfer P, Gutjahr W, Hartl RF, Reimann M (2007). Metaheuristics: Progress in Complex Systems Optimization. Springer.

- **Planned learning activities and teaching methods**

  Teaching includes lectures, tutorials, case study discussion, lab sessions

- **Assessment methods assessment methods and criteria**

  Final written exam (100%) or

  Final written exam (70%) + assignment (individual) 30%

  Students must achieve >= 5 grade in written exam

- **Language of instruction**

  Greek

- **Work placement(s)**

  N/A