Study program: Informatics

Course title: Operational Research

Professor/assistant: Slavica Đ. Šarenac

Type of course: Compulsory

ECTS credits: 5

Prerequisites: None

Aims of the course:

Students realize the role and significance of optimization, mathematical methods and models for managing organizational, technical and other complex systems, in order to find optimal solutions for making managerial decisions.

Learning outcomes:

After passing the course, the student, as a part of a working team, will be able to analyze, solve tasks and suggest the best solutions to the management, and to control the implementation of the proposed solution in practice.

Syllabus:

Theoretical Classes

1. General considerations and concepts. Methods of operational research.
2. Linear programming (general formulation of the LP task, graphic method, Simplex method, dual problem, stepwise analysis, the problem of the maximum, modified forms of the system, problem of the minimum).
3. Transport problem; methods for finding the initial solution; methods for finding the optimal solution, degeneration in transport.
4. Network planning technique; structure analysis (list of activities, basic elements of the network diagram, rules of drawing and numbering the network diagram); time analysis (CPM method, PERT method); comparison of CPM and PERT methods; optimization by the PERT method.
5. Contemporary operational research programs (connection between operational research and information technology, operational research software).

Practical Lessons

Practical exercises – team project

Literature:

1. Krčevinac, S., Cengalović, M., Kovačević-Vujičić, V., Martić, M., Vukosević, M., Operaciona istraživanja 1, FON, Beograd, 2013.
2. Krčevinac, S., Cengalović, M., Kovačević-Vujičić, V., Martić, M., Vukosević, M., Operaciona istraživanja 2, FON, Beograd, 2013.
3. Vujošević, M., Linearno programiranje, FON, Beograd, 2013.
4. Stanimirović, P., Jovanović, I., Mrežno planiranje, PMF, Niš, 2008.

Number of active classes: 45	**Lectures:** 30	**Practical classes:** 15

Teaching methods: Lectures, practical exercises.

Grading system (maximum 100 points)

grading scale from 5 to 10: below 51 points – student fails the exam, grade 6 from 51- 60 points, grade 7 from 61-70 points, grade 8 from 71-80 points, grade 9 from 81-90 points, grade 10 from 91- 100 points.

Pre-exam obligations:	**Points:**	**Final exam:**	**Points:**
Activity during lectures	max 5	Oral exam	50
Practical training	max 5		
Written test(s)	max 30		
Term paper	max 10		
Minimum requirement for the final exam	30		