Study program / study programs:
(301) Economics
(302) Business management
(303) Statistics

Type and level of studies: doctoral academic

Course title: Modeling and Optimization

Course code: DMIO

Professors (Name, middle name, last name)**:** Marko M. Backović, Zoran Ž. Popović

Course status: required

ESPB Number: 10

Condition:

Course objectives:
Gaining quantitative techniques and models that are necessary for the realization of research at the micro and macro level. Depending on the candidate narrower scientific field and the subject of his/her doctoral dissertation, different methodological concepts, which will be the basis for future scientific research, will be considered.Previous knowledge: Knowledge of mathematics (linear algebra and mathematical analysis) and operational research appropriate to a higher level of economics studies is assumed.

Outcome of the course:
Knowing and mastering the way in which a number of significant mathematical models are used, analyzing their application and significant results, which are the basis for making optimal decisions in the domain of management and economic policy.

Content of the course:
Methods of optimization - Mathematical Programming:
1. Linear Programming, Nonlinear Programming, Integer Programming, Goal Programming, Quadratic Programming
2. Multiple criteria optimization
3. Dynamic programming
4. Dynamic optimization
5. Game theory

Literature:
1. Winston, W. Operations Research, Applications and Algorithms, Duxbury Press, Belmont, 1994.
2. Hiller, F. & Liberman, G., Introduction to Operations Research, McGraw Hill, 2001.
3. Pavličić, D. Decision making theory, CID, Faculty of Economics, Belgrade, 2004.
4. Backović, M. &Popović, Z. Mathematical Modeling and Optimization, CID, Faculty of Economics, Belgrade, 2012.

Number of classes				Other classes :
Lectures: 4	Exercises: 0	Other forms of teaching: 0	Research study: 3	0

Methods of teaching:
Teaching is carried out through lectures, seminars and research study work.

Knowledge assessment (maximum score 100)			
Pre-exam obligations	points	Final exam	points
Research study	40	Oral exam	60