Course catalogue

NUT-IIE-IZ01 Modelling and optimisation in nutrition

Programme	Nutrition
Level	Master's programme
Academic year Semester	I year Autumn Semester
ECTS credits	6 credits
Lecturers	Assoc. Prof. Dr.sc Vesna Knights
Language	Macedonian/English

Objective	The objective of the systems analysis course is to deepen and illustrate the mathematical concepts on the basis of a series of very concrete examples. Topics covered include: linear box models with one or several variables, non-linear box models with one or several variables, time-discrete models, and continuous models in time and space.
Content	Introduction to mathematical modeling and optimization. Building and classification of mathematical models. Database of energy and nutritional composition of food products. Basics of linear optimization. Numerical methods of optimization. Linear regression, method of smallest squares, trapezoidal method, syrup method. Pareto optimization. Analysis and simulation of processes. Overview of software for optimization, programming and analysis. Economic optimization.
Learning materials	Reading from the primary literature are referenced in class and posted to the course website. <ol start="5"> - Luenberger David G., Linear and Nonlinear Programming, 2nd Edition, Springer, 2003. - Hamdy A. Taha , Operations Research: An Introduction, Pearson Prentice Hall, 2003. - Timothy J. Ross, Fuzzy *Logic with Engineering Applications,* 2nd Edition, Wiley, 2004. - Hertog, M.L.A.T.M.; Nicolaá, B.M *, Food Process Modelling.* Woodhead Publishing, 2001.