

Course title:	<b>Econometrics and operation research</b>				Code:
Field of study:	<b>Tourism and recreation</b>				Year/Semester: <b>3</b>
Specialization:	<b>Management and marketing</b>				Modes: <b>F/E</b>
Number of hours / semester <b>60/32</b>					ECTS credits: <b>3</b>
Lectures: <b>30/16</b>	Classes: <b>30/16</b>	Laboratories:	Projects:	Seminars:	

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**Course position in the study programme:**

- specialization course

**Objectives:**

- presentation of selected mathematical and statistical methods supporting management.

**Course contents:**

1. The nature of operations research. Operations research methodology. A classification of decision problems.
2. Linear programming methods: the simplex algorithm
  - a) the butcher's problem (graphical and algebraic solution)
  - b) detailed steps for finding a new basic solution in the simplex algorithm, tabular format, slack variables and artificial variables
  - c) computer solutions to linear programming problems
3. Linear programming methods: the transportation problem
  - a) a transportation problem
  - b) an initial solution, improving the initial solution, the next solution
  - c) mathematical statement of the transportation problem
4. Deterministic analysis network
  - a) critical path method (CPM and CPM-COST)
  - b) program evaluation and review technique (PERT and PERT-COST)
5. Decisions under uncertainty and risk

- a) determining of optimal quantity resources
  - b) analysis of waiting lines
6. The nature of the econometric approach, the general structural form of econometric model
  7. Linear econometric models:
    - a) selection of variables explaining economic phenomena
    - b) determining structural parameters of model (the least-squares estimation method) and parameters stochastic structure of model
    - c) examination accuracy of model
  8. Some remarks about the econometrical prediction

**Teaching methods:** lectures, classes

**Assessment methods:** written final quiz comprising lectures and classes

**Recommended reading:**

**Compulsory:**

1. Guzik B. (red.), Ekonometria i badania operacyjne, Wyd. Akademii Ekonomicznej, Poznań 2002
2. Kukułka K. i inni, Badania operacyjne w przykładach i zadaniach, PWN, Warszawa 1994
3. Nowak E., Zarys metod ekonometrii, PWN, Warszawa 1994

**Supplementary:**

1. Thiel H., Principles of econometrics, Toronto 1971
2. Plane D.R., Kochenberger G.A., Operations research for managerial decisions, RD 1972