Faculty of Engineering Management

| Profile of study | | | STU | OY MODULE D | ES | CRIPTION FORM | | | |
|--|--|----------------------------|---|------------------------|--------|-----------------------------------|--------|------------------------------|--|
| Elective path/specialty Production and Operations Management Production and Operations Management Production and Operations Management Second-cycle studies Second-cycle studies Second-cycle studies No. of hours Lecture: 16 Classes: 14 Laboratory: - Project/seminars: - 3 Status of the course in the study program (Basic, major, other) (brak) Education areas and fields of science and art social sciences Economics Responsible for subject / lecturer: dr Tomasz Brzęczek email: tomasz-brzeczek@put.poznan.pl tel. 61 665 33 92 Wydziel Inzylerii Zarządzania ul. Strzelecka 11 60-965 Poznah Prerequisites in terms of knowledge, skills and social competencies 1 Knowledge Student knows economic terms and management problems, especially operation management problems. 2 Skills Student knows conomic terms and management problems, especially operation management problems. Student knows and operations of matrix algebra. Student works in team and prepares project. Course (compulsory, electh obligatory Course (compulsory, electh obligatory Porm of study (full-time,part-time) Rom of study (full-time,part-time) Project/seminars: - 3 1 ON of credits Carrelities | Name of the module/subject Operational Research and Econometrics | | | | | - | | | |
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| Production and Operations Management Polish Polish | Engi | neering Manage | ment - Pa | rt-time studies | - | ,• | , | 1/1 | |
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| Skills: | | | | | | | | | |
| | | | ares method. | - [K2A_W10] | | | | | |
| | Skills | : | | | | | | | |

- 2. Uses optimization methods: graphical, simplex, graphs and transportation algorithm. [K2A_U04,]
- $3. \ Student \ estimates \ or \ optimizes \ models \ with \ Excel, \ GRETL \ and \ Solver \ (inc. \ Solver \ Foundation). \ \ \ [K2A_U07]$
- 4. Uses multi criteria methods (aims hierarchy, metacriterion, fulfillment degre, AHP). [K2A_U04]
- 5. Estimates linear and linaerizable econometric models with OLS. [K2A_U04]
- 6. Explains results of optimization and econometric models and uses them in management. [K2A_U02]

Social competencies:

Faculty of Engineering Management

- 1. Student is aware of optimization benefits in management and planning. [K2A_K03]
- 2. Spreads optimization in management problem solving. [K2A_K05]
- 3. Can objectively assess and analyze data and solutions of management problems. [S2A_K06]

Assessment methods of study outcomes

Exercises pass with mark from written test in theory and tasks.

Course description

- 1. Estimation of linear and linearizable econometric models with OLS.
- 2. Clasification and modeling of decision tasks. Problems of production structure, mixture, resource division, transportation and tasks allocation.
- 3. Linear programming. Simplex and graphical method.
- 4. Multi-criteria continous programming. Metacriterion, objectives hierarchy.
- 5. Multi-criteria integer programming. Fulfillment degre, AHP.
- 6. Net programming. CPM? critical path method. PERT-program evaluation and review technique.
- 7. Transportat optimization problem and Little algorithm.
- 8. Basics of nonlinear programming.

Basic bibliography:

- 1. Balakrishnan N., Render B., Stair RM., Managerial Decision Modeling with Spreadsheets, Pearson Education 2006.
- 2. Brzęczek T., Gaspars-Wieloch H., Godziszewski B., Podstawy badań operacyjnych i ekonometrii, Wydawnictwo PP, Poznań 2010.
- 3. Maddala G.S., Lahiri K., Introduction to Econometrics 4-th edition, Wiley 2009.
- 4. Ravindran A.R. (ed.), Operations Research and Management Science Handbook, 904 p., Operations Research Series, CRC Press 2007.
- 5. Przykłady i zadania z badań operacyjnych i ekonometrii, Sikora W. (red.), Wyd. UEP, seria MD 163, Poznań 2005.
- 6. Taha H.S., Operations Research: An Introduction (8-th Edition), 813 p., 2006 (with AMPL and Excel Solver examples).

Additional bibliography:

- 1. Krajevski LJ., Ritzman LP., Malhorta MK., Operations Management, Prentice Hall Int., 2006.
- 2. Węglarz J., Modelowanie i optymalizacja. Badania operacyjne i systemowe, Exit, Warszawa 2003.
- 3. Winston W.L., Operations Research: Applications and Algorithms (with CDrom and InfoTrac) 1440 p., Duxbery Press 2003.

Result of average student's workload

| Activity | Time (working hours) |
|-----------------|----------------------|
| 1. Lectures | 16 |
| 2. Exercises | 14 |
| 3. Consultation | 30 |
| 4. Student | 30 |

Student's workload

| Source of workload | hours | ECTS | |
|----------------------|-------|------|--|
| Total workload | 90 | 3 | |
| Contact hours | 60 | 2 | |
| Practical activities | 30 | 1 | |