GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Production Processes - Methods of Decision Making, PG_00031755		
Field of study	Automation, Robotics and Control Systems		
Date of commencement of studies	February 2023	Academic year of realisation of subject	2023/2024
Education level	second-cycle studies	Subject group	
Mode of study	Full-time studies	Mode of delivery	at the university
Year of study	2	Language of instruction	Polish
Semester of study	3	ECTS credits	4.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Control Systems Engineering -> Faculty of Electrical and Control Engineering		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Robert Piotrowski	
	Teachers		

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	30.0	0.0	30.0	0.0	0.0	60

E-learning hours included: 0.0

Learning activity and number of study hours

Learning activity	Participation in didactic classes included in study plan	Participation in consultation hours	Self-study	SUM
Number of study hours	60	5.0	35.0	100

Subject objectives

The aim of the course is to familiarise students with selected issues of optimisation and decision support in manufacturing processes.

Learning outcomes

Course outcome	Subject outcome	Method of verification
K7_U04	Students will be able to select an optimisation method for a specific type of industrial process.	[SU1] Assessment of task fulfilment
K7_U03	The student is able to find optimal solutions for network issues, e.g. transport problems, minimum roads.	[SU5] Assessment of ability to present the results of task
K7_W06	The student knows optimisation methods for decision support in industrial processes.	[SW3] Assessment of knowledge contained in written work and projects
K7_W11	The student is able to implement optimisation methods for discrete, binary and network problems in a computer environment, e.g. Matlab	[SW3] Assessment of knowledge contained in written work and projects
K7_U07	Students will be able to solve optimization tasks (discrete and binary).	[SU3] Assessment of ability to use knowledge gained from the subject

Subject contents

General information

Decision models for discrete processes

Discrete integer programming

Discrete-time binary programming

Network programming

Transport issues and the traveling salesman problem

Summary

Prerequisites and co-requisites

None

<table>
<tr><td>Assessment methods and criteria</td><td colspan="2"><table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Colloquium 1</td><td>50.0%</td><td>35.0%</td></tr>
<tr><td></td><td>50.0%</td><td>30.0%</td></tr>
<tr><td>Colloquium 2</td><td>50.0%</td><td>35.0%</td></tr>
</table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td>Cormen T.H., Leiserson Ch.,E. Rivest R., Stein C. Wprowadzenie do algorytmów. Wydanie 7. PWN, Warszawa 2012 (tłumaczenie).

Deo N. Teoria grafów i jej zastosowania w technice i informatyce. PWN, Warszawa 1980 (tłumaczenie).

Praca zbiorowa (red. Sikora W.). Badania operacyjne. PWE, Warszawa 2008.

Sysło M.M., Deo N., Kowalik J.S. Algorytmy optymalizacji dyskretnej. PWN, 1999.

Trzaskalik T. Wprowadzenie do badań operacyjnych z komputerem. Wydanie 2. PWE, Warszawa 2008.

Zorychta K., Ogryczak W. Programowanie liniowe i całkowitoliczbowe. WNT, 1981.</td></tr>
<tr><td>Supplementary literature</td><td>Chen D.-S., Batson R.G., Dang Y. Applied Integer Programming: Modeling and Solution. John Wiley&Sons, 2010.

Williams H.P. Model Building in Mathematical Programming. 4th edition. John Wiley&Sons, 1999.

Williams H.P. Model Solving in Mathematical Programming. John Wiley&Sons, 1993.</td></tr>
<tr><td>eResources addresses</td><td>Adresy na platformie eNauczanie:</td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="2">What is the difference between the Euler cycle and the Hamilton cycle in a graph ?</td></tr>
<tr><td>Work placement</td><td colspan="2">Not applicable</td></tr>
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