GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Optimization in Automatics II, PG_00047576		
Field of study	Automatic Control, Cybernetics and Robotics		
Date of commencement of studies	October 2022	Academic year of realisation of subject	2023/2024
Education level	first-cycle studies	Subject group	Obligatory subject group in the field of study Subject group related to scientific research in the field of study
Mode of study	Full-time studies	Mode of delivery	at the university
Year of study	2	Language of instruction	Polish
Semester of study	4	ECTS credits	1.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Decision Systems and Robotics -> Faculty of Electronics, Telecommunications and Informatics		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Henryk Kormański	
	Teachers	dr inż. Henryk Kormański	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	0.0	0.0	15.0	0.0	0.0	15

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	15	1.0	9.0	25

Subject objectives

Practical knowledge of static optimization algorithms and their application in automation.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_U09] can carry out a critical analysis of the functioning of existing technical solutions and assess these solutions, as well as apply experience related to the maintenance of technical systems, devices and facilities typical for the field of studies, gained in the professional engineering environment	Is able to use optimization methods when solving problems in various fields.	[SU4] Assessment of ability to use methods and tools
[K6_U01] can apply mathematical knowledge to formulate and solve complex and non-typical problems related to the field of study and perform tasks, in an innovative way, in not entirely predictable conditions, by:n- appropriate selection of sources and information obtained from them, assessment, critical analysis and synthesis of this information,n- selection and application of appropriate methods and toolsn	He can formulate the problem of optimization in mathematical form and solve it by numerical methods.	[SU4] Assessment of ability to use methods and tools

<table>
<tr><td>Subject contents</td><td>1. Familiarization with specialized OPTIMUM software for solving OS and problems
research on optimization algorithms.
2. Familiarization with the VISUAL program for graphical presentation (2D, 3D) of the objective function,
equality and inequality constraints and stepwise operation of the algorithms.
3. Examination of numerical properties of optimization algorithms without restrictions.
4. Examination of numerical properties of optimization algorithms with constraints
5. Troubleshooting optimal control problems for static objects using the OPTIMUM package.
6. Overview and discussion of the most interesting solutions.</td></tr>
<tr><td>Prerequisites
and co-requisites</td><td></td></tr>
<tr><td>Assessment methods
and criteria</td><td>
<table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>laboratory grade</td><td>50.0%</td><td>100.0%</td></tr>
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<tr><td>Recommended reading</td><td>
<table>
<tr><td>Basic literature</td><td>1) Lecture Optimization Principles in Automation.
2) Laboratory instructions.</td></tr>
<tr><td>Supplementary literature</td><td>J.Nocedal, S.J.Wright, “Numerical Optimization”, Springer, 1999</td></tr>
<tr><td>eResources addresses</td><td>Adresy na platformie eNauczanie:</td></tr>
</table>
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<tr><td>Example issues/
example questions/
tasks being completed</td><td></td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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