



## Subject card

Subject name and code	Operational Research, PG_00047719						
Field of study	Informatics						
Date of commencement of studies	October 2022		Academic year of realisation of subject		2022/2023		
Education level	second-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	Part-time studies		Mode of delivery		at the university		
Year of study	1		Language of instruction		Polish		
Semester of study	2		ECTS credits		4.0		
Learning profile	general academic profile		Assessment form		exam		
Conducting unit	Department of Algorithms and Systems Modelling -> Faculty of Electronics, Telecommunications and Informatics						
Name and surname of lecturer (lecturers)	Subject supervisor		prof. dr hab. inż. Marek Kubale				
	Teachers		prof. dr hab. inż. Marek Kubale  dr Paweł Obszarski  prof. dr hab. inż. Michał Pióro				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	12.0	0.0	0.0	15.0	0.0	27
	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	27		15.0		58.0	100
Subject objectives	The aim of the course is to acquaint the student with the basic scheduling algorithms and linear programming.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K7_W01] Knows and understands, to an increased extent, mathematics to the extent necessary to formulate and solve complex issues related to the field of study.	Student knows basic algorithms for task scheduling in models with parallel machines and dedicated machines.	[SW1] Assessment of factual knowledge
	[K7_U01] can apply mathematical knowledge to formulate and solve complex and non-typical problems related to the field of study by:n- appropriate selection of source information and its critical analysis, synthesis, creative interpretation and presentation,n- application of appropriate methods and toolsn	Student knows the Simplex method for linear programming.	[SU2] Assessment of ability to analyse information
	[K7_U05] can plan and conduct experiments related to the field of study, including computer simulations and measurements; interpret obtained results and draw conclusions	Student knows how to formulate linear programs.	[SU1] Assessment of task fulfilment
	[K7_U08] while identifying and formulating engineering tasks specifications and solving these tasks, can:n- apply analytical, simulation and experimental methods,n- notice their systemic and non-technical aspects,n- make a preliminary economic assessment of suggested solutions and engineering workn	Student knows basic model of task scheduling. He/she knows how to describe them using 3-field notation.	[SU2] Assessment of ability to analyse information
	[K7_W03] Knows and understands, to an increased extent, the construction and operating principles of components and systems related to the field of study, including theories, methods and complex relationships between them and selected specific issues - appropriate for the curriculum.	Student is able to make use of software dedicated to linear programming.	[SW3] Assessment of knowledge contained in written work and projects
Subject contents	Models of task scheduling. Tree-field notation. Selected algorithms for scheduling on identical processors. Selected algorithms for scheduling on dedicated processors . The definition of Linear Programming problems (LP). Applications of LP. Graphical interpretation. Simplex Method.		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Exam after semester.	50.0%	100.0%
Recommended reading	Basic literature	Janiak A., Wybrane problemy i algorytmy szeregowania zadań, Akademicka Oficyna Wydawnicza PLJ, Warszawa 1999;  Hiller F. Liberman G, Introduction to Operations Research, McGraw-Hill, 2010	
	Supplementary literature	Brucker P., Scheduling Algorithms, Springer Science & Business Media, 2007;  Błażewicz J., Cellary W., Słowiński R., Węglarz J., Badania operacyjne dla informatyków, WNT, Warszawa, 1983;  Judin D.E, Golsztein E.G., Metody programowania liniowego, WNT 1964.	
	eResources addresses	Adresy na platformie eNauczanie:	

Example issues/ example questions/ tasks being completed	Not concern
Work placement	Not applicable