

SDAŃSK UNIVERSITY 的 OF TECHNOLOGY

Subject card

Subject name and code	Application of Mathematics in Technology, PG_00042010								
Field of study	Power Engineering, Power Engineering, Power Engineering, Power Engineering, Power Engineering								
Date of commencement of studies	October 2020		Academic year of realisation of subject			2021/2022			
Education level	first-cycle studies		Subject group			Obligatory subject group 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	3		ECTS credits			3.0			
Learning profile	general academic profile		Assessment form			assessment			
Conducting unit	Department of Control and Power Engineering -> Faculty of Ocean Engineering and Ship Technology						nnology		
Name and surname	Subject supervisor		dr inż. Klaudia Wrzask						
of lecturer (lecturers)	Teachers		dr inż. Paweł Ziółkowski						
		dr inż. Klaudia	a Wrzask						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project		Seminar	SUM	
	Number of study hours	15.0	15.0	0.0	0.0		0.0	30	
	E-learning hours included: 0.0								
	Adresy na platformie eNauczanie: Zastosowanie matematyki w technice (PG_00042010) - Moodle ID: 17428 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=17428								
Learning activity and number of study hours	Learning activity	Participation in classes includ plan	n didactic ed in study	ctic Participation in study consultation hours		Self-study		SUM	
	Number of study 30 hours			3.0		42.0		75	
Subject objectives	Aibility of mathematical methods application in engineering								
Learning outcomes	Course out	Subject outcome			Method of verification				
	K6_W01		Student has basic knowledge of mathematics necessary to describe the phenomena related to the processes of energy conversion and transfer; when solving mathematical problems, he uses information technologies, including Mathematica packages			[SW1] Assessment of factual knowledge [SW2] Assessment of knowledge contained in presentation			
	K6_U02		The student is able to apply mathematical methods and tools to design elements, systems and energy systems.			[SU4] Assessment of ability to use methods and tools [SU1] Assessment of task fulfilment			
Subject contents	Signal approximation and processing, Fourier series, Fourier transform, Fourier analysis, solving differential equations, Laplace transform, basic concepts and application of the theory of random processes, fuzzy set theory and its application, genetic algorithms and their applications.								
Prerequisites and co-requisites	knowledge of mathematics fundamentals								
Assessment methods	Subject passing criteria		Passing threshold			Percentage of the final grade			
and criteria	midterm collogia		50.0%			50.0%			
	test		50.0%			50.0%			

Recommended reading	Basic literature	[1] Cooper G.R., Mc Gillem C.D.: Probabilistic Methods of Signal and Systems Analysis. New York-Oxford University Press, 1999, [2] Jordan D.W., Smith P.: Mathematical Techniques. Oxford University Press, 1998, [3] Lathi B.P.: Signal Processing and Linear Systems. Berkeley Cambridge Press, 1998, [4] Fausett L.: Fundamentals of Neural Networks. Prentice Hall, 1994, [5] Hassoun M. H.: Fundamentals of Artificial Neural Networks. MIT Press, 1995, [6] Cox E.: The Fuzzy Systems Handbook. Academic Press, London 1994				
St eF	Supplementary literature	No requirements				
	eResources addresses	Zastosowanie matematyki w technice (PG_00042010) - Moodle ID: 17428 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=17428				
Example issues/ example questions/ tasks being completed	purpose of signal modelling using Fourier series, reason of applying both trigonometrical and exponential Fourier series, state space role in mathematical modelling of engineering processes, impulse response role in particular solution of vectorial differential equations, random process analysis using statistical characteristics, fuzzy logic and fuzzy set notion, engineering process analysis using fuzzy set method, analysis of engineering process dynamics using artifitial neural network method, genetic algorithm application in design and control optimisation					
Work placement	Not applicable					