



Subject card

Subject name and code	Application of Mathematics in Technology, PG_00042010						
Field of study	Power Engineering						
Date of commencement of studies	October 2021		Academic year of realisation of subject		2022/2023		
Education level	first-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		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						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Klaudia Wrzask				
	Teachers		dr inż. Klaudia 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						
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	30		3.0		42.0	75
Subject objectives	Ability of mathematical methods application in engineering						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
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 and criteria	Subject passing criteria		Passing threshold		Percentage of the final grade		
	test		50.0%		50.0%		
	midterm colloquia		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				
	Supplementary literature		No requirements				
	eResources addresses		Adresy na platformie eNauczanie: Zastosowanie matematyki w technice, Energetyka, W/Ć, sem. 3, zima 22/23, (PG_00042010) - Nadróbka - Moodle ID: 25919 https://enauzanie.pg.edu.pl/moodle/course/view.php?id=25919				
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 artificial neural network method, genetic algorithm application in design and control optimisation						
Work placement	Not applicable						