



## Subject card

Subject name and code	SAS programming, PG_00023765						
Field of study	Mathematics						
Date of commencement of studies	October 2023		Academic year of realisation of subject		2024/2025		
Education level	first-cycle studies		Subject group		Optional subject group 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		2.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Division of Nonlinear Analysis -> Institute of Applied Mathematics -> Faculty of Applied Physics and Mathematics						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Magdalena Chmara				
	Teachers		dr inż. Magdalena Chmara				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	30.0	0.0	0.0	30
	E-learning hours included: 0.0						
	Adresy na platformie eNauczanie:						
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		2.0		18.0	50
Subject objectives	The aim of the course is to acquaint the student with the SAS 4GL programming language and familiarity with the principles of macro programming in SAS. Develop basic skills in language 4GL and macro programming. Presentation of the possibility of applying the acquired skills into practice.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	K6_U10		Student can write and run a program in the SAS 4GL language: loads, creates and processes data sets, performs initial data analysis. Uses macros. Is able to use SAS to calculate descriptive statistics and create basic charts.		[SU1] Assessment of task fulfilment [SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools [SU5] Assessment of ability to present the results of task		
	K6_U07		Student recognizes problems that can be solved with SAS.		[SU4] Assessment of ability to use methods and tools [SU5] Assessment of ability to present the results of task		
	K6_W09		Student is able to use SAS Studio.		[SW1] Assessment of factual knowledge [SW2] Assessment of knowledge contained in presentation		
Subject contents	1. Introduction - programming workspace, libraries 2. Programming for SAS - PROC STEP, DATA STEP 3. SAS data Sets - reading data sets - SET, MERGE instructions, GO TO and LINK instructions - filtering of data - variables, observations, renaming of variables - sorting and processing in groups - basic informations - combining data sets - SET and MERGE instructions - transposition of data sets 4. Data computations - SAS terms - numerical constants, character constants, operators - SAS functions - IF statement, DO loop - remembering informations in the main loop - LAG, DIF - sorting sets and processing in groups - arrays and temporary arrays 5. Formats and informat 6. Creating and using indexes 7. Services procedures 8. Macroprogramming in SAS - macro variables - SAS macro variables - macro functions - creating and application macro programs - using of macro programs - global and local variables - IF statement and DO loop - storage of macro programs						
Prerequisites and co-requisites	No conditions.						

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	individual project	50.0%	40.0%
	Activity	50.0%	20.0%
	Midterm colloquium	50.0%	40.0%
Recommended reading	Basic literature	<i>Programming in SAS - data processing. Partial I - 4GL language</i> , Anna Szafrńska, Publisher PG, Gdańsk 2013.  SAS Documentation on the webside: <a href="https://support.sas.com/en/documentation.html">https://support.sas.com/en/documentation.html</a>	
	Supplementary literature	No recommendations	
	eResources addresses		
Example issues/ example questions/ tasks being completed	Sample task: Based on PRDSALE file from the library SASHELP create a report (pdf) annual sales of products in different countries.  Questions: 1. Explain the concept - phase of compilation and execution phase. 2. Explain the mode of action DATA steppe.		
Work placement	Not applicable		

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