Subject card

Subject name and code	SAS programming, PG_00023765					
Field of study	Mathematics					
Date of commencement of studies	October 2022		Academic year of realisation of subject	2023/2024		
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	Divison 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						

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 purpose of the course is: to familiarize the student with the SAS 4GL programming language to familiarize the student with the principles of macro programming in SAS to present the possibility of applying the acquired skills in 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 informats 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	*Programming in SAS - data processing. Partial I - 4GL language*, Anna Szafrańska, Publisher PG, Gdańsk 2013. SAS Documentation on the webside: https://support.sas.com/en/documentation.html *SAS Programming and Data Visualization Techniques A Power User's Guide,* Philip R. Holland, Apress Berkeley, CA, https://doi.org/10.1007/978-1-4842-0568-6
	Supplementary literature	No recommendations
	eResources addresses	Podstawowe https://link.springer.com/book/10.1007/978-1-4842-0568-6 - SAS Programming and Data Visualization Techniques A Power User's Guide, Philip R. Holland, Apress Berkeley, CA, https://doi.org/10.1007/978-1-4842-0568-6 https://support.sas.com/en/documentation.html - SAS Documentation Adresy na platformie eNauczanie: Programowanie w SAS 2024 - Moodle ID: 35770 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=35770
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	

Document generated electronically. Does not require a seal or signature.