

Subject card

Subject name and code	Data Imputation Methods, PG_00157337						
Field of study	Informatics and Econometrics						
Date of commencement of studies	October 2024		Academic year of realisation of subject		2024/2025		
Education level	Master's 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	full-time studies		Mode of delivery		at the university		
Year of study	1		Language of instruction		Polish		
Semester of study	2		ECTS credits		2.0		
Learning profile	academic		Assessment form		credit		
Conducting unit	Department of Statistics -> Faculty of Management -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr Tomasz Jurkiewicz				
	Teachers		dr Tomasz Jurkiewicz				
			mgr Katarzyna Raca				
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	15.0	0.0	0.0	15
	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	15		15.0		20.0	50
Subject objectives	Understand the concepts and issues related to missing data in sample surveys and the consequences of missing data, learn about and be able to practise data imputation methods.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[liEMU2_K02] The student can communicate freely with the public on specialised topics in the field of computer science and econometrics in and outside the workplace, communicate his knowledge and share his skills through various media. Culturally participates in discussions, is not afraid to ask questions and knows how to give constructive criticism.	Able to communicate freely, culturally and assertively with the public on specialised topics in the field of data imputation, to impart knowledge and to share skills.	[SK1] oral statement/conversation/discussion [SK3] text preparation/written work [SK5] implementation of a problem task
	[liEMU2_K01] The student understands the need for continuous completion and deepening of acquired knowledge. The student inspires and organizes others' learning processes.	Understands the need to continuously complement and deepen the acquired knowledge of data imputation.	[SK1] oral statement/conversation/discussion [SK5] implementation of a problem task
	[liEMU2_W05] The student has an in-depth knowledge of socio-economic data sources, their databases and how to create them.	Has an in-depth knowledge of data sources, their databases and how they are created and the inadequacies they present.	[SW1] oral statement/conversation/discussion [SW5] implementation of a problem task
	[liEMU2_W04] The student has an in-depth knowledge of advanced mathematical, statistical, econometric and IT methods that enable the acquisition, processing and analysis of data reflecting the functioning and growth of the national economy and its components, as well as the phenomena and processes occurring in their environment.	Has in-depth knowledge of advanced statistical and IT methods for processing and analysing databases with missing data.	[SW1] oral statement/conversation/discussion [SW3] text preparation/written work [SW5] implementation of a problem task
	[liEMU2_U05] The student is able to make a statistical description of basic and detailed economic categories at an advanced level, formulate and verify hypotheses about their formation.	Able to make a statistical description at an advanced level from data with missing data present.	[SU1] oral statement/conversation/discussion [SU3] text preparation/written work [SU5] implementation of a problem task
	[liEMU2_K03] The student is able to communicate freely with the public inside and outside the workplace, transfer his knowledge and share his skills through various media.	Able to communicate freely with the public, communicate his/her knowledge and share his/her skills with incomplete data.	[SK1] oral statement/conversation/discussion [SK5] implementation of a problem task
	[liEMU2_U06] The student is able to forecast complex economic phenomena and processes at an advanced level and check the properties of the obtained forecasts.	Can forecast complex phenomena at an advanced level based on incomplete data.	[SU1] oral statement/conversation/discussion [SU3] text preparation/written work [SU5] implementation of a problem task
Subject contents	The basics of sample research, its advantages and shortcomings. Causes and sources of random and non-random errors in surveys. Effects of missing data on data quality. Analysis of the bias due to missing data. The need to use additional data sources to improve the quality of estimates. Sources of additional data. Methods of dealing with missing data - general idea of imputation and calibration approaches. Concept and objectives of imputation, basic methods of imputation. Advantages and disadvantages of univariate and multivariate imputation. The problem of variance estimation when imputation is present. Weighting in the presence of missing data.		
Prerequisites and co-requisites	Completed course in statistics, mathematical statistics, sampling methods, computational programming.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Oral statement	51.0%	10.0%
	final project	51.0%	90.0%
Recommended reading	Basic literature	C.E. Sarndal, S. Lundstrom, Estimation in Surveys with Nonresponse, Wiley. N. T. Longford, Missing Data and Small-Area Estimation, Springer	
	Supplementary literature	M. L. Stein, Interpolation of Spatial Data, Springer	
	eResources addresses		

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

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