

Subject card

Subject name and code	Event History Analysis, PG_00157339						
Field of study	Informatics and Econometrics						
Date of commencement of studies	October 2024		Academic year of realisation of subject			2025/2026	
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	2		Language of instruction			Polish	
Semester of study	3		ECTS credits			1.0	
Learning profile	academic		Assessment form			credit	
Conducting unit	Department of Statistics -> Faculty of Management -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. Ewa Wycinka				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	15.0	0.0	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		10.0		15.0	40
Subject objectives	Understanding the issues related to studying the duration of time until event occurs in the presence of censored data. Learning methods for analyzing data concerning the time elapsed from the initial event to the final event. Acquiring skills in applying regression models in the case of censored data. Developing the ability to interpret the obtained results.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[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.	The student, working in a group, is able to present the results of their analysis and discuss different approaches to the analysis of censored data. He/she is able to present their results and conclusions effectively in both written and oral form.	[SK2] presentation/project/paper/report
	[liEMU2_W05] The student has an in-depth knowledge of socio-economic data sources, their databases and how to create them.	The student has knowledge of various sources of socio-economic data. He/she knows how these data are collected, processed and how they can be used in survival analysis.	[SW2] presentation/project/paper/report
	[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.	The student participates in discussions on specialised issues in survival analysis, both in the context of theoretical issues and practical applications. He/she is able to communicate his/her knowledge and skills as well as participate in discussions, ask questions and give constructive criticism.	[SK2] presentation/project/paper/report
	[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.	The student knows how to use advanced mathematical, statistical and econometric methods to analyse censored data. He/she has knowledge of how these methods can be applied to analyse the functioning of the national economy and its components.	[SW2] presentation/project/paper/report
	[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.	Students will be able to perform advanced statistical descriptions of data on the duration of economic phenomena, formulate hypotheses concerning these phenomena and verify them using appropriate statistical tests.	[SU2] presentation/project/paper/report
	[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.	Students will be able to forecast the time distribution of various economic phenomena using survival analysis models.	[SU2] presentation/project/paper/report
Subject contents	Essence and applications of survival analysis. Duration as a random variable. Types of studies in survival analysis (cohort and cross-sectional study, full and censored studies). Estimators survival functions for censored data (reduced sample estimator, actuarial estimator, Kaplan-Meier estimator, Aalen-Nelson estimator). Statistical tests in the analysis of censored data. Regression models in event history analysis: Cox proportional hazard model, Cox non-proportional hazard model. Explanatory variables in regression models (coding method, variable functions). Verification of assumptions of the Cox model (testing proportionality of hazards, residuals in the model). Goodness of fit measures.		
Prerequisites and co-requisites	Knowledge of probability calculus: random variables and their distributions, parameters of distributions, and of mathematical statistics: point and interval estimation, hypothesis testing.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	group project	51.0%	100.0%

Recommended reading	Basic literature	Wycinka E., Modele zdarzeń konkurujących i ich zastosowania w ocenie ryzyka niewypłacalności pożyczkobiorcy, Wyd. UG 2019, (chapters 1.1-1.3; 2.1-2.3) Balicki A., Analiza przeżycia i tablice wymieralności, PWE, Warszawa 2006; Jackowska B., Modele dalszego trwania życia oraz ich zastosowania w przypadku osób starszych, Wyd. UG 2013 Stanisz A., Przystępny kurs statystyki z zastosowaniem STATISTICA PL na przykładach z medycyny. Tom 3. Analizy wielowymiarowe, Chapter 8, Statsoft Polska, Kraków 2007
	Supplementary literature	Frątczak E.Gach-Ciepiela U., Babiker H., Analiza historii zdarzeń, SGH Warszawa 2005; Jurkiewicz T., Wycinka E., Significance tests of differences between two crossing curves for small samples, Acta Universitatis Lodzensis, Folia Oeconomica 255, 2011, s. 107-114 Klein J.P., Moeschberger M.L., Survival Analysis Techniques for Censored and Truncated Data, Springer-Verlag, 2003 Kleinbaum D., Klein M., Survival Analysis. A Self-Learning Text, Third Edition 2012 Ostasiewicz O. (red.), Metody oceny i porządkowania ryzyka w ubezpieczeniach życiowych, Wyd. Akademii Ekonomicznej we Wrocławiu, 2000;
	eResources addresses	
Example issues/ example questions/ tasks being completed	The student selects a research problem that can be solved using survival analysis methods, conducts a statistical study using the methods learned and statistical software. He/she prepares the project in the form of a written paper and presents the results to the group. Assessment takes into account: correctness and completeness of the formulated conclusions and methods used. Research project: For the selected research problem, estimate the distribution of durations and interpret the differences resulting from the use of different estimators; assess the differences in the distribution of durations for the identified groups of individuals (using appropriate tests); identify the factors differentiating the distribution of durations and, on this basis, build hazard models taking into account the influence of the highlighted risk factors; Examine the fulfilment of the assumptions of the model and assess its goodness of fit. All results must be interpreted accordingly.	
Work placement	Not applicable	

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