



**Universitas Brawijaya**  
**Faculty of Mathematics and Natural Sciences**  
**Department of Statistics / Bachelor Statistics Study Programme**

**Module Handbook**

Module Name:	Survival Analysis (MAS62222)	
Module Level:	Bachelor	
Abbreviation, if applicable:	-	
Sub-heading, if applicable:	-	
Courses included in the module, if applicable:	-	
Semester/term:	6th / Third Year	
Module Coordinator(s):	Dr. Adji Achmad Rinaldo Fernandes, M.Si	
Lecturer(s):	Dr. Adji Achmad Rinaldo Fernandes, M.Si	
Language:	Indonesian	
Classification within the curriculum:	Elective course	
Teaching format / class per week during semester:	3 × 50 minutes	
Workload:	2.5 hours lectures, 3 hours structural activities, 3 hours individual studies, 16 weeks per semester, and total 136 hours per semester 4.5 ECTS	
Credit Points:	3	
Requirements:	Introduction to Probability Theory (MAS6211), Introduction to Regression Analysis (MAS62122)	
Learning goals / competencies:	<b>General Competence (Knowledge):</b>	
	ILO1	The students are able to master basic scientific concepts and statistical analysis methods applied on computing, social science, humanities, economics, industry and life science.
	ILO2	The students are able to arrange and/or choose an efficient data collection/ data generated design that applies in surveys, experiments or simulations.
	ILO3	The students are able to manage, analyze, and complete the real case using statistical method on computing, social humanities, economics, industry and life science that helped by software, then present and communicate the results.
	ILO4	The students are able to master at least two statistical softwares, including based on open source.

	ILO5	The students are able to apply logical, critical, systematic, and innovative thinking independently when applied to science and technology that contain humanities values, based on scientific principles, procedures and ethics with excellent and measurable results.
	ILO6	The students are able to take appropriate decisions to solve the problems expertly, based on the information and data analysis.
	ILO7	The students are able to improve and develop a job networks, then supervise and evaluate the team's performance they lead.
	ILO8	The students are able to apply and internalize the spirit of independence, struggle, entrepreneurship, based on values, norms, and academic ethics of Pancasila in all aspects of life.
	<b>Specific Competence:</b>	
	M1	Students are able to understand the basic concepts of cumulative probability theory as a basis for survival analysis (ILO3, ILO1, ILO5)
	M2	Students are able to apply the concept of hazard function survival analysis (ILO3, ILO1, ILO5)
	M3	Students are able to apply parametric survival analysis using cox proportional hazard approach (ILO3, ILO4, ILO5, ILO7, ILO8)
	M4	Students are able to apply a nonparametric survival analysis using Kaplan Maier approach (ILO3, ILO4, ILO5, ILO7, ILO8)
	M5	Students are able to use software R for survival analysis (ILO3, ILO4, ILO5, ILO7, ILO8)
Contents:	1	Introduction to Survival Analysis: Basic definitions, Censored data, Survivor Functions, Hazard Functions and their properties, Life tables, Descriptive Measures
	2	Kaplan Meier Survival Curve, Testing Log-Ranks and their alternatives
	3	Evaluation of PH assumptions: Graphic Approach, Goodness of Fit Testing Approach, Time-dependent variable approach
	4	Cox Proportional Hazard (PH) Model
Soft skill attribute:	Responsible, independently, and discipline	
Study/exam achievement:	Final score (NA) is calculated as follow: 20% assignments, 25% Quizzes, 25% Midterm Exam, 30% Final Exam Final index is defined as follow:	

	A : > 80 - 100 B+ : > 75 - 80 B : > 69 - 75 C+ : > 60 - 69 C : > 55 - 60 D+ : > 50 - 55 D : > 44 - 50 E : 0 - 44
Forms of media:	Laptop, LCD projector, whiteboard
Learning methods:	Lecture, assessments, and discussion
Literature:	<b>Main:</b>
	1. Kleinbaum, D.G., Klein M., 2005, Survival Analysis A Self-Learning Text, Springer, New York.
	2. Collet, D. 1994. Modelling Survival Data in Medical Research. Chapman and Hall. London.
	<b>Support:</b>
	1. Miller, R.G., Survival Analysis, Wiley, New York, 1981.
Notes:	