



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

Module Handbook

Module Name:	Analysis of Reliability (MAS61333)	
Module Level:	Bachelor	
Abbreviation, if applicable:	-	
Sub-heading, if applicable:	-	
Courses included in the module, if applicable:	-	
Semester/term:	5th / Third Year	
Module Coordinator(s):	Dr. Adji Achmad Rinaldo Fernandes, S.Si.,M.Sc	
Lecturer(s):	Dr. Adji Achmad Rinaldo Fernandes, S.Si.,M.Sc	
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 Regression Analysis (MAS62122), Mathematical Statistics (MAS62115)	
Learning goals / competencies:	General Competence (Knowledge):	
	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.
	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.

	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.
	Specific Competence:	
	M1	Students are able to understand the definition of Hazard function, Mean Time to Failure, Mean Time Between Failure, distribution of life time in reliability. (ILO3, ILO1, ILO5)
	M2	Students are able to determine and interpret reliability of both parametric and non-parametric approach. (ILO3, ILO1, ILO5)
	M3	Students are able to plan, apply, and evaluate reliability system and interpret the output. (ILO3, ILO1, ILO5)
	M4	Students are able to present the output of reliability analysis either through manual process or using software, in both written or oral, in a form of individual or group assignment. (ILO3, ILO4, ILO5, ILO7, ILO8)
	M5	Students are able to apply warranty analysis either through manual process or using software, present the modeling output and its analysis in writing or verbally, in a form of individual or group assignment. (ILO3, ILO4, ILO5, ILO7, ILO8)
Contents:	1	Definition of reliability, hazard function, density function, Mean Time To Failure, Mean Time, Between Failure
	2	Distribution of life time (Exponential, Weibull, Rayleigh, Normal and Lognormal) in reliability
	3	Stationary Stochastic model
	4	Non parametric reliability
	5	Parametric reliability
	6	Reliability system that is not complex and complex and its evaluation
	7	Warranty analysis in reliability
Soft skill attribute:	Responsible, independently, and discipline	
Study/exam achievement:	Final score (NA) is calculated as follow: 40% Assignments, 20% Quizzes, 15% Midterm Exam, 25% 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:	Main: 1. Elsayed, A. 1996. Reliability Engineering, Addison Wesley, Longman, Inc. Support: 1. Barlow, R.E., dan Proschan, F. 1965. Mathematical Theory of Reliability, Wiley, New York. 2. Crowder, M.I., Kimber, A.C., Smith, R.L., dan Swetting, T.J. 1991. Statistical Analysis of Reliability Data. Chapman and Hall, London. 3. Lewis, E. 1987. Introduction to Reliability Engineering, Wiley. 4. Mc Cormick. 1981. Reliability and Risk Analysis, Academic Press, New York, 1981. 5. Sinha, S.K., dan Kale, B.K. 1980. Life Testing and Reliability Estimation, Wiley, Eastern.
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