



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

Module Handbook

Module Name:	Smoothing Method (MAS61325)	
Module Level:	Bachelor	
Abbreviation, if applicable:	-	
Sub-heading, if applicable:	-	
Courses included in the module, if applicable:	-	
Semester/term:	3rd/ Second Year	
Module Coordinator(s):	Ir. Heni Kusdarwati, MS.	
Lecturer(s):	Ir. Heni Kusdarwati, MS.	
Language:	Indonesian	
Classification within the curriculum:	Elective Course	
Teaching format / class per week during semester:	2 × 50 minutes	
Workload:	1.67 hours lectures, 2 hours structural activities, 2 hours individual studies, 16 weeks per semester, and total 90.67 hours per semester 3 ECTS	
Credit Points:	2	
Requirements:	Introduction to Regression Analysis (MAS62122)	
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.

	ILO6	The students are able to take appropriate decisions to solve the problems expertly, based on the information and data analysis.
	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 apply the basic concepts of time series data trend (ILO3, ILO5)
	M2	Students are able to use model goodness measure (ILO3, ILO4, ILO5, ILO6, ILO8)
	M3	Students are able to select and apply moving average and exponential smoothing for horizontal data trend (ILO3, ILO5)
	M4	Students are able to choose and apply smoothing methods appropriately and apply them to data trend (ILO1, ILO3, ILO4, ILO5)
	M5	Students are able to choose and apply smoothing methods appropriately and apply them to seasonal data (ILO1, ILO3, ILO4, ILO5)
	M6	Students are able to understand the theoretical basis for more advanced smoothing methods (ILO1, ILO3, ILO4, ILO5)
	M7	Students are able to do classical decomposition analysis (ILO3, ILO4, ILO5)
	M8	Students are able to convey the results of the analysis of the smoothing method in writing or orally, in the form of individual or group assignments (ILO1, ILO3, ILO4, ILO5, ILO6, ILO8)
Contents:	1	Types of time series
	2	Accuracy of forecasting models
	3	Single moving average, multiple and linier moving average
	4	Single exponential smoothing
	5	Double smoothing method: Brown, Holt
	6	Triple smoothing method: Winter
	7	Pegel classification, other smoothing method
	8	Classic decomposition
	9	Introduction to Census Decomposition
	10	Regression smoothing and time series smoothing with trend

Soft skill attribute:	Responsible, independently, and discipline
Study/exam achievement:	Final score (NA) is calculated as follow: 10% Assignments, 20% Group Assignments and Presentation, 20% Quizzes, 25% 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:	Minitab, MS. Excel, Laptop, LCD projector,
Learning methods:	Lecture, assessments, and discussion
Literature:	<p>Main:</p> <p>Makridakis, Wheelwright, and Hydiman. 2008. Forecasting: Methods and Application. 3rd Edition. John Wiley & Sons.</p> <p>Support:</p> <p>1. Ledolter, J. and Abraham, B. 1983. Statistical Method to Forecasting. John Wiley & Sons, New York.</p> <p>2. Berenson, ML, David ML and Timothy CK. 2006. Basic Business Statistics. Concepts and Application. Pearson Prentice Hall.</p>
Notes:	