



Bachelor Program in Geophysics

Faculty of Mathematics and Natural Sciences
HASANUDDIN UNIVERSITY

30. Forecasting Methods

Module Name	:	Forecasting Methods								
Module Level	:	Bachelor								
Code, if applicable	:	23H06132102								
Subtitle, if applicable	:	-								
Courses, if applicable	:	Geophysics								
Semester(s) in which the module is taught	:	V (Fifth Semester)								
Module coordinator(s)	:	Prof. Dr. Halmar Halide, M.Sc.								
Lecturer(s)	:	Prof. Dr. Halmar Halide, M.Sc.								
Language	:	Bahasa (Indonesian language)								
Relation to curriculum	:	Elective in the fifth semester for a Bachelor's Degree in Geophysics								
Type of teaching, contact hours	:	This course is delivered through Lectures (i.e., Project/Case-based learning), complemented by structured assignments (paper review, project/case evaluation) and independent study. Contact hours consist of 100 minutes lectures per week, plus 120 minutes per week for each of the following: structured assignments and independent study								
Workload	:	Total workload is 90 hours per semester, consisting of 28 hours for lectures, and 31 hours each for structured assignments and independent study								
Credit points	:	2 SKS (3.2 ECTS)								
Requirements according to the examination regulations	:	Students are eligible to attend the examination if their absences are less than 20% of the lectures								
Recommended prerequisites	:	-								
Module objectives/intended learning outcomes	:	After completion of this module, students will be able to: CLO 1. Able to produce geophysical disaster predictive models that are tested, reliable and economically valuable. The following is the mapping of the ILO and the CLO of this course: <table><tr><td></td><td>ILO 7</td><td>ILO 9</td><td>ILO 13</td></tr><tr><td>CLO 1</td><td>✓</td><td>✓</td><td>✓</td></tr></table>		ILO 7	ILO 9	ILO 13	CLO 1	✓	✓	✓
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CLO 1	✓	✓	✓							



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Content	:	1. Modeling, accuracy, and economic efficiency of Multiple Regression and Stepwise Regression models 2. Modeling, accuracy, and economic efficiency of PCA (Principal Component Analysis) models, 3. Modeling, accuracy, and cost-effectiveness of Discriminant Analysis (Linear and Quadratic) models, 4. Modeling, accuracy, and cost-effectiveness of Machine Learning (Decision Tree) models, 5. Project: Hydrometeorological, Ecological, and Health Disasters and Mitigation.																														
Study and examination requirements		Participants are marked based on their performance in theory: Case Study (100%). Students are marked based on their percentage of points obtained and based on the following grade scale: <table border="1"> <thead> <tr> <th>Percentage of Achievement</th><th>Grade</th><th>Conversion Value</th></tr> </thead> <tbody> <tr> <td>85 – 100</td><td>A</td><td>4.00</td></tr> <tr> <td>80 - <85</td><td>A-</td><td>3.75</td></tr> <tr> <td>75 - < 80</td><td>B+</td><td>3.5</td></tr> <tr> <td>70 - < 75</td><td>B</td><td>3.0</td></tr> <tr> <td>65 - < 70</td><td>B-</td><td>2.75</td></tr> <tr> <td>60 - < 65</td><td>C+</td><td>2.5</td></tr> <tr> <td>50 - < 60</td><td>C</td><td>2.00</td></tr> <tr> <td>40 - < 50</td><td>D</td><td>1.00</td></tr> <tr> <td>< 40</td><td>E</td><td>0.00</td></tr> </tbody> </table>	Percentage of Achievement	Grade	Conversion Value	85 – 100	A	4.00	80 - <85	A-	3.75	75 - < 80	B+	3.5	70 - < 75	B	3.0	65 - < 70	B-	2.75	60 - < 65	C+	2.5	50 - < 60	C	2.00	40 - < 50	D	1.00	< 40	E	0.00
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Exams and assessment formats		Assessment in this course is conducted entirely through case studies, designed to evaluate both theoretical understanding and practical application of the CLO. This work is developed over several weeks under instructor guidance, culminating in a written report and an oral presentation of results.																														
Reading list		Main References:																														



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	1. Daniel Wilks, 2011. Statistical Methods in the Atmospheric Sciences, Volume 100, 3 rd Edition, Academic Press. 2. Halmar Halide, 2021. Desain Peringatan Dini Cuaca Ekstrem Berbasis Kinematika Gerak Siklon, Penerbit: FMIPA Unhas. 3. Ian T. Jolliffe and David B. Stephenson (Editors), 2012. Forecast Verification: A Practitioner's Guide in Atmospheric Science, 2 nd Edition, John Wiley & Sons. Additional References: 1. S. G. Makridakis, S. C. Wheelwright, and Rob J Hyndman, 1998. Forecasting: Methods and Applications, 3 rd Edition, John Wiley & Sons
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