



INSTITUT TEKNOLOGI SEPULUH NOPEMBER
FAKULTAS SAINS DAN ANALITIKA DATA
PROGRAM STUDI DOKTOR ILMU STATISTIK
DEPARTEMEN STATISTIKA

Kode Dokumen

Rev 1

RENCANA PEMBELAJARAN SEMESTER

MATA KULIAH (MK)		KODE	Rumpun MK	BOBOT (sks)		SEMESTER	Tgl Penyusunan
Model Linier Tergeneralisir		SS256102	Analitika Data Ekonomi dan Finansial	T=3	P=0	I	Agustus 2026
OTORISASI		Pengembang RPS		Koordinator RMK		Kepala PRODI	
		Prof. Drs. Nur Iriawan, M.Ikomp, Ph.D ; Prof. Drs. Purhadi, M.Sc		Dr. Muhammad Sjahid Akbar, S.Si., M.Si.		Irhamah, S.Si, M.Si, Ph.D.	
Capaian Pembelajaran (CP) <i>Learning Outcome (LO)</i>	CPL-PRODI yang dibebankan pada MK						
	CPL-7 <i>PLO-7</i>	Mampu menciptakan dan memvalidasi teknik komputasi statistik inovatif serta mengkritisi kekuatan dan kelemahannya dalam konteks data riil yang kompleks. <i>Able to create and validate innovative statistical-computing techniques and critically appraise their strengths and limitations in complex real-world data contexts.</i>					
	CPL-8 <i>PLO-8</i>	Mampu mengembangkan metode statistika atau model teoritis baru, serta mengevaluasi kontribusinya terhadap pengembangan ilmu statistik dan aplikasinya dengan pendekatan interdisipliner <i>Able to develop new statistical methods or theoretical models and evaluate their contribution to the advancement of statistics and its applications through an interdisciplinary approach.</i>					
	CPL-9 <i>PLO-9</i>	Mampu mengintegrasikan dan mengembangkan metode statistika berbasis komputasi dan analitik untuk mengatasi permasalahan riil di bidang bisnis, industri, ekonomi, finansial, sosial dan pembangunan berkelanjutan, lingkungan, kesehatan, serta mengevaluasi dampaknya terhadap pengambilan keputusan <i>Able to integrate and develop computation- and analytics-based statistical methods to address real-world problems in business, industry, economics and finance, social and sustainable development, environment, and health, and to evaluate their impact on decision-making.</i>					
	Capaian Pembelajaran Mata Kuliah (CPMK)						
	CPMK-1	Mampu menganalisis dan membandingkan perbedaan dan kesamaan antara Linear model (LM), General Linear Model (GLM), dan Generalized Linear Model (GLMs) <i>Able to analyze and compare the differences and similarities between Linear Model (LM), General Linear Model (GLM), and Generalized Linear Model (GLMs)</i>					
	CPMK-2	Mampu membuat model dengan respon uni-modal diskrit (bernoulli, binomial, Poisson, Geometri, Poisson-Gamma, Pareto-Gamma) dalam GLMs <i>Able to create models with discrete uni-modal responses (Bernoulli, binomial, Poisson, Geometric, Poisson-Gamma, Pareto-Gamma) in GLMs</i>					
CPMK-3	Mampu membuat model dengan respon uni-modal kontinu (non-normal dan neo-normal) dalam GLMs <i>Able to explain and create models with continuous uni-modal responses (non-normal and neo-normal) in GLMs</i>						

Pembelajaran	<i>Statistical Theory, Data Collection, Description and Exploration, Computing and Data Processing, Modeling, Economics and Management.</i>
Pustaka	Utama :
	<ol style="list-style-type: none"> 1. McCullagh, P. dan Nelder, J.A.(1990). Generalized Linear Models. Chapman and Hall: New York. 2. Hardin, J. dan Hilbe, J. 2007. Generalized Linear Models and Extensions, 2nd Edition. College Station, Texas: Stata Press 3. Jong, P., D. dan Heller, G. Z., 2008, Generalized Linear Models for Insurance Data, Cambridge University Press, New York 4. Myers, R., H., Montgomery, D., C., dan Vining, G. G., 2010. Generalized linear models: with applications in engineering and the sciences, John Wiley & Sons, New Jersey 5. Lee, Y., Nelder, J. A., dan Pawitan, Y., 2006. Generalized Linear Models with Random Effects, Chapman & Hall, London 6. Dobson, A. J., 2002. An Introduction to Generalized Linear Models, 2nd Edition, Chapman & Hall, London, CRC Press 7. Smithson, M. Dan Merkle, E. C. 2014. Generalized Linear Models for Categorical and Continuous Limited Dependent Variables. Taylor & Francis Group, London, CRC Press 8. Iriawan, N. 2012 Pemodelan dan Analisis Data Driven, ITS Press, Surabaya 9. Box, G.E.P dan Tiao, G. C. 1973. Bayesian Inference in Statistical Analysis, John Wiley & Sons, New Jersey
	Pendukung :
Dosen Pengampu	Prof. Drs. Nur Iriawan, M.Ikomp, Ph.D ; Prof. Drs. Purhadi, M.Sc
Matakuliah syarat	

Mg Ke-	Kemampuan akhir tiap tahapan belajar (Sub-CPMK)	Penilaian		Bantuk Pembelajaran, Metode Pembelajaran, Penugasan Mahasiswa, [Estimasi Waktu]		Materi Pembelajaran [Pustaka]	Bobot Penilaian (%)
		Indikator	Kriteria & Bentuk	Luring (<i>offline</i>)	Daring (<i>online</i>)		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	Memahami konsep berfikir LM, GLM, dan GLMs serta konsep link-function Understand the concept of thinking LM, GLM, and GLMs as well as the concept of link-function	<ol style="list-style-type: none"> 1. Mampu menjelaskan dan memberi contoh tentang LM, GLM, dan GLMs. 2. Mampu menentukan link-function suatu pola respon data <ol style="list-style-type: none"> 1. Able to explain and give examples about LM, GLM, and GLMs. 2. Able to determine the link-function of a data response pattern 	Tugas 1, Observasi di kelas Task 1, Observation in class	Ceramah, diskusi dan latihan soal 150 Menit Lectures, discussions and practice questions 150 Minutes		Linear model, General Linear Model (GLM), dan Generalized Linear Model (GLMs) Linear models, General Linear Models (GLM), and Generalized Linear Models (GLMs)	
2	Mampu menjelaskan fenomena respon berpola normal dengan varians konstan.	<ol style="list-style-type: none"> 1. Mampu menerangkan, memberi contoh, fenomena respon normal dengan varians konstan. 2. Mampu membedakan struktur error model 3. Mampu mengkategorikan jenis systematic componet pada model 	Tugas 2, Observasi di kelas	Ceramah, diskusi dan latihan soal 150 Menit		Model regresi respon normal dengan varians konstan	

Mg Ke-	Kemampuan akhir tiap tahapan belajar (Sub-CPMK)	Penilaian		Bantuan Pembelajaran, Metode Pembelajaran, Penugasan Mahasiswa, [Estimasi Waktu]		Materi Pembelajaran [Pustaka]	Bobot Penilaian (%)
		Indikator	Kriteria & Bentuk	Luring (offline)	Daring (online)		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Able to explain the phenomenon of normal patterned response with constant variance.	4. Mampu membedakan model dengan struktur intrinsik dan ekstrinsik aliasing 1. Able to explain, give examples, normal response phenomena with constant variance. 2. Be able to distinguish the structure of the error model 3. Able to categorize the types of systematic components in the model 4. Able to distinguish models with intrinsic and extrinsic aliasing structures	Task 2, Observation in class	Lectures, discussions and practice questions 150 Minutes		Normal response regression model with constant variance	
3	Mampu menjelaskan filosofi respon biner, bernoulli, binomial dan memodelkan sebagai bentuk GLMs Able to explain the philosophy of binary, Bernoulli, binomial response and model it as a form of GLMs	1. Mampu menerangkan, memberi contoh, perbedaan antara fenomena respon biner, bernoulli, dan binomial 2. Dapat melakukan estimasi model regresi dengan respon biner 1. Be able to explain, give examples, the difference between binary, Bernoulli, and binomial response phenomena 2. Can perform regression model estimation with binary response	Tugas 3, Observasi di kelas Task 3, Observation in class	Ceramah, diskusi dan latihan soal 150 Menit Lectures, discussions and practice questions 150 Minutes		Biner, Bernoulli, & Binomial, dan Regresi dengan respon biner Binary, Bernoulli & Binomial, and Regression with binary response	
4	Mampu menjelaskan filosofi respon politomous dan multinomial, serta memodelkan sebagai bentuk GLMs Able to explain the philosophy of polytomous and multinomial responses, as well as modeling as a form of GLMs	1. Dapat menerangkan, memberi contoh dan membedakan antara politomous dan multinomial 2. Dapat melakukan estimasi model regresi dengan respon nominal dan ordinal 1. Can explain, give examples and differentiate between polytomous and multinomial 2. Can perform regression model estimation with nominal and ordinal responses	Tugas 4, Observasi di kelas Task 4, Observation in class	Ceramah, diskusi dan latihan soal 150 Menit Lectures, discussions and practice questions 150 Minutes		politomous & multinomial dan regresi dengan respon politomous polytomous & multinomial and regression with polytomous responses	
5	Mampu menjelaskan filosofi respon Poisson, Negatif Binomial, dan	Mampu membedakan dan memodelkan permasalahan dengan Regresi Poisson, menangani masalah overdispersion dengan Negatif Binomial, dan Zero-	Tugas 5, Observasi di kelas	Ceramah, diskusi dan latihan soal 150 Menit		Regresi Poisson Poisson's Regression	

Mg Ke-	Kemampuan akhir tiap tahapan belajar (Sub-CPMK)	Penilaian		Bantuk Pembelajaran, Metode Pembelajaran, Penugasan Mahasiswa, [Estimasi Waktu]		Materi Pembelajaran [Pustaka]	Bobot Penilaian (%)
		Indikator	Kriteria & Bentuk	Luring (offline)	Daring (online)		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Zero-Inflated dan Hardle model Be able to explain the philosophy of Poisson response, Negative Binomial, and Zero-Inflated and Hardle models	Inflated dan Hardle model. Able to distinguish and model problems with Poisson Regression, handle overdispersion problems with Negative Binomial, and Zero-Inflated and Hardle models.	Task 5, Observation in class	Lectures, discussions and practice questions 150 Minutes			
6& 7	Mampu menjelaskan filosofi struktur pola data neo-normal Able to explain the philosophy of neo-normal data pattern structure	Mampu membedakan dan memodelkan permasalahan dengan melakukan relaksasi normalitas pada pendekatan model Exponential Power, MSNBurr, MSTBurr, Azzalini, Stable, Skewed-normal, dan skewed-student . Able to distinguish and model problems by relaxing normality in the Exponential Power, MSNBurr, MSTBurr, Azzalini, Stable, Skewed-normal, and skewed-student models approaches.	Tugas 6, Observasi di kelas Task 6, Observation in class	Ceramah, diskusi dan latihan soal 300 Menit Lectures, discussions and practice questions 300 Minutes		Regresi neo-normal Neo-normal regression	
8, 9, & 10	Mampu menjelaskan filosofi struktur pola data hirarki Able to explain the philosophy of hierarchical data structure patterns	Mampu membedakan dan memodelkan permasalahan data dengan struktur hirarki menggunakan pemodelan hirarki Able to distinguish and model data problems with hierarchical structures using hierarchical modeling	Tugas 7, Observasi di kelas Task 7, Observation in class	Ceramah, diskusi dan latihan soal 450 Menit Lectures, discussions and practice questions 450 Minutes		Model hirarki Hierarchical model	
11	Mampu menjelaskan konsep dan filosofi survival dengan data respon waktu dan data count banyak keberulangan hingga akhir proses Able to explain the concept and philosophy of survival with time	1. Mampu membedakan dan memodelkan permasalahan survival dengan respon waktu 2. Mampu membedakan dan memodelkan permasalahan survival dengan respon banyak keberulangan hingga akhir proses 1. Able to distinguish and model survival problems with response time 2. Able to distinguish and model survival problems with many repetition responses until the end of the process	Tugas 8, Observasi di kelas Task 8, Observation in class	Ceramah, diskusi dan latihan soal 300 Menit Lectures, discussions and practice questions 300 Minutes		Regresi respon waktu dan respon banyak keberulangan hingga akhir proses Response time regression and response multiple times until the end of the process	

Mg Ke-	Kemampuan akhir tiap tahapan belajar (Sub-CPMK)	Penilaian		Bantuk Pembelajaran, Metode Pembelajaran, Penugasan Mahasiswa, [Estimasi Waktu]		Materi Pembelajaran [Pustaka]	Bobot Penilaian (%)
		Indikator	Kriteria & Bentuk	Luring (offline)	Daring (online)		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	response data and count data many times until the end of the process						
12 & 13	Memahami cara pemodelan GLMs pada sistem yang berstruktur mixture Understand how to model GLMs on systems with mixture structures	1. Mampu mengidentifikasi permasalahan yang mempunyai struktur model mixture 2. Mampu memodelkan fenomena yang berstruktur mixture dengan GLMs 1. Able to identify problems that have a mixture model structure 2. Able to model phenomena with mixture structure with GLMs	Tugas 9, Observasi di kelas Task 9, Observation in class	Ceramah, diskusi dan latihan soal 300 Menit Lectures, discussions and practice questions 300 Minutes		Mixture model Mixture models	
14	Memahami cara pembentukan beberapa alternatif model GLMs dan memahami cara pemilihan model GLMs terbaik Understand how to form several alternative GLMs models and understand how to select the best GLMs model	1. Mampu membentuk beberapa kemungkinan model GLMs atas data yang dihadapi 2. Mampu menyusun alat perbandingan model untuk memilih model terbaik 1. Able to form several possible models of GLMs on the data encountered 2. Able to develop a model comparison tool to select the best model	Tugas 10, Observasi di kelas Task 10, Observation in class	Ceramah, diskusi dan latihan soal 150 Menit Lectures, discussions and practice questions 150 Minutes		Pemilihan model terbaik Best model selection	
15 & 16	Memahami materi yang ditugaskan dan memahami alternatif model GLMs yang paling tepat untuk digunakan. Understand the assigned material and understand the most appropriate	Mampu menerapkan GLMs yang paling tepat untuk menyelesaikan masalah riil dan mampu menyampaikan/mengkomunikasikan baik lisan maupun tertulis dengan sempurna Able to apply the most appropriate GLMs to solve real problems and be able to convey/communicate both verbally and in writing perfectly	Laporan proyek, Aktifitas diskusi, dan Observasi di kelas Project reports,	Ceramah, diskusi dan latihan soal 150 Menit Lectures, discussions and practice questions 150 Minutes		Projek Kajian GLMs GLMs Study Project	

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		Indikator	Kriteria & Bentuk	Luring (<i>offline</i>)	Daring (<i>online</i>)		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	alternative GLMs model to use.		discussion activities, and observations in class				