



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

Kode Dokumen

RENCANA PEMBELAJARAN SEMESTER

MATA KULIAH (MK)		KODE	Rumpun MK	BOBOT (sks)		SEMESTER	Tgl Penyusunan
Analisis Multivariat Lanjut		SS256251	Statistika dan Sains Data Lingkungan dan Kesehatan	T=3	P=0	II	Agustus 2026
OTORISASI		Pengembang RPS		Koordinator RMK		Kepala PRODI	
		Prof. Dr. Bambang Widjanarko Otok., M.Si.		Prof. Dr. Bambang Widjanarko Otok., M.Si.		Irhamah, S.Si, M.Si, Ph.D.	
Capaian Pembelajaran (CP) <i>Learning Outcome (LO)</i>	CPL-PRODI yang dibebankan pada MK						
	CPL-4 <i>PLO-4</i>	Mampu mengembangkan Teori Statistika untuk menyelesaikan permasalahan statistik. <i>Able to conduct in-depth study and develop statistical theory to solve statistical problems.</i>					
	CPL-5 <i>PLO-5</i>	Mampu mengembangkan metodologi pengumpulan data terstruktur dan tidak terstruktur berbasis pengamatan, eksperimen, sampling, dan simulasi <i>Able to design and develop methodologies for collecting structured and unstructured data based on observation, experimentation, sampling, and simulation.</i>					
	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-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 mengembangkan teori statistika untuk menyelesaikan permasalahan statistik. <i>Able to develop statistical theories to solve statistical problems.</i>					
CPMK-2	Mampu mengembangkan metodologi pengumpulan data terstruktur dan tidak terstruktur berbasis pengamatan, eksperimen, sampling, dan simulasi. <i>Able to develop methodologies for collecting structured and unstructured data based on observation, experimentation, sampling, and simulation.</i>						

	CPMK-3	Mampu menciptakan dan memvalidasi teknik komputasi statistik inovatif serta mengkritisi kekuatan dan kelemahannya dalam konteks data riil yang kompleks. <i>Able to develop and validate innovative statistical computing techniques and critically assess their strengths and limitations in the context of complex real-world data.</i>																																																		
	CPMK-4	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 computational and analytical statistical methods to address real-world problems in business, industry, economics, finance, social and sustainable development, environment, and health, as well as evaluate their impacts on decision-making.</i>																																																		
		Matrik CPL – CPMK <table><tr><td>CPMK</td><td>CPL-1</td><td>CPL-2</td><td>CPL-3</td><td>CPL-4</td><td>CPL-5</td><td>CPL-6</td><td>CPL-7</td><td>CPL-8</td><td>CPL-9</td></tr><tr><td>CPMK-1</td><td></td><td></td><td></td><td>V</td><td></td><td></td><td>V</td><td></td><td>V</td></tr><tr><td>CPMK-2</td><td></td><td></td><td></td><td>V</td><td></td><td></td><td>V</td><td></td><td>V</td></tr><tr><td>CPMK-3</td><td></td><td></td><td></td><td>V</td><td></td><td></td><td>V</td><td></td><td>V</td></tr><tr><td>CPMK-4</td><td></td><td></td><td></td><td>V</td><td></td><td></td><td>V</td><td></td><td>V</td></tr></table>	CPMK	CPL-1	CPL-2	CPL-3	CPL-4	CPL-5	CPL-6	CPL-7	CPL-8	CPL-9	CPMK-1				V			V		V	CPMK-2				V			V		V	CPMK-3				V			V		V	CPMK-4				V			V		V
CPMK	CPL-1	CPL-2	CPL-3	CPL-4	CPL-5	CPL-6	CPL-7	CPL-8	CPL-9																																											
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Deskripsi Singkat MK	Mata kuliah ini membahas pengembangan teori statistika, metodologi pengumpulan data, serta teknik komputasi statistik inovatif untuk menyelesaikan permasalahan statistik yang kompleks. Mahasiswa diarahkan untuk mengembangkan dan memvalidasi metode statistika berbasis pengamatan, eksperimen, sampling, simulasi, komputasi, dan analitik, serta mengintegrasikannya dalam penyelesaian permasalahan nyata pada berbagai bidang. Mata kuliah juga menekankan kemampuan mengevaluasi kelebihan, keterbatasan, dan dampak metode yang dikembangkan terhadap pengambilan keputusan. <i>This course covers the development of statistical theories, data collection methodologies, and innovative statistical computing techniques to address complex statistical problems. Students are guided to develop and validate statistical methods based on observation, experimentation, sampling, simulation, computation, and analytics, and to integrate these methods in addressing real-world problems across various fields. The course also emphasizes the ability to evaluate the strengths, limitations, and impacts of developed methods on decision-making.</i>																																																			
Bahan Kajian: Materi Pembelajaran	Matematika. Teori Statistika, Deskripsi dan Eksplorasi, Komputasi dan Data Prossessing, Pemodelan, Kesehatan dan Lingkungan <i>Mathematics. Statistical Theory, Description and Exploration, Computing and Data Processing, Modeling, Health and Environment</i>																																																			
Pustaka	Utama : 1. Johnson, R.A and Wichern, D.W, 2007. Applied Multivariate Statistical Analysis,6th Edition, Prentice Hall, New York. 2. Hair, J.F., Black, W.C., Babin, B.J., Anderson, R.E, 2010. Multivariate Data Analysis, 7th Edition, Prentice-Hall, UK 3. Rencher, A.C. Methods of Multivariate Analysis, 2nd Edition, John Wiley 4. Sarma, S. 1996. Applied Multivariate Techniques, John Wiley 5. Anderson, T.W, 2003, An Introduction to Multivariate Statistical Analysis, Wiley Interscience																																																			

	6. Morison, D.F, 2005, Multivariate Statistical Method, McGraw-Hill Inc., Tokyo. 7. Byrne, B.M, 2001, Structural Equation Modelling with AMOS: Basic Concept, Applications and Programming, Lawrence Erlbaum Associates Inc., New Jersey. 8. Mardia, K.V, Kent, J.T, Bibby, J.M, 2000. Multivariate Analysis, 7th Edition. Academic Press.
	Pendukung :
Dosen Pengampu	Prof. Dr. Bambang Widjanarko Otok., M.Si.
Mata kuliah 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 (offline)	Daring (online)		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	1. Mampu menjelaskan konsep dasar analisis multivariat. 2. Memahami konsep matriks yang sering dipakai dalam analisis multivariate 1. <i>Able to explain the basic concepts of multivariate analysis.</i> 2. <i>Understand the concept of matrices that are often used in multivariate analysis</i>	1.1. Mampu membedakan antara data univariat dan data multivariate serta pengelompokan metode univariat dan metode multivariate. 1.2. Memahami konsep matriks yang sering digunakan dalam analisis multivariate.	Tes tulis Tugas 1 Observasi di kelas <i>Writing Test Task 1</i> <i>Observation in class</i>	Ceramah, diskusi dan latihan soal <i>Lectures, discussions and exercise</i> 150 menit <i>150 minutes</i>		- Konsep dasar analisis multivariate - Aljabar matriks dan vector random. <i>The basic concepts of multivariate analysis</i> <i>Matrix algebra and random vectors.</i>	5%/5%

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)
		1.1 Able to distinguish between univariate data and multivariate data as well as grouping univariate and multivariate methods. 1.2 Understand the concept of matrices that are often used in multivariate analysis.					
2	1. Preprocessing data 2. Memahami konsep distribusi normal multivariat. 1. <i>Preprocessing data</i> 2. <i>Understand the concept of multivariate normal distribution.</i>	2.1 Dapat mendeteksi dan mengatasi outlier dan missing value. 2.2 Dapat Menguji asumsi kenormalan data multivariate dan cara-cara mengatasinya	Tes tulis Tugas 1 Observasi di kelas <i>Writing Test</i> <i>Task 1</i> <i>Observation in class</i>	Ceramah, diskusi dan latihan soal <i>Lectures, discussions and exercise</i> 150 menit <i>150 minutes</i>		• Missing value • Outlier • Distribusi normal multivariate • <i>Missing value</i> • <i>Outliers</i> • <i>Multivariate normal distribution</i>	5%/10%

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)
		jika asumsi dilanggar <i>2.1 Can detect and resolve outliers and missing values.</i> <i>2.2 Can Test the assumption of normality of multivariate data and ways to overcome it if the assumption is violated</i>					
3	1. Memahami konsep daerah kepercayaan dan uji hipotesis vector rata-rata satu dan dua populasi normal multivariat 2. Memahami konsep daerah kepercayaan dan uji hipotesis vector rata-rata lebih dari dua populasi normal multivariate	3.1 Dapat menentukan, menghitung dan menganalisis daerah kepercayaan dan uji hipotesis vector rata-rata satu dan dua populasi	Tes tulis Tugas 2 Observasi di kelas <i>Writing Test</i> <i>Task 2</i> <i>Observation in class</i>	Ceramah, diskusi dan latihan soal <i>Lectures, discussions and exercise</i> 150 menit <i>150 minutes</i>		daerah kepercayaan dan uji hipotesis vector rata-rata satu dan dua populasi <i>manova, manacova</i> <i>confidence area and test the hypothesis of the vector mean of one and two populations</i> <i>manova, manacova</i>	5%/15%

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)
	<i>1. Understand the concept of confidence area and test the vector hypothesis of the mean of one and two multivariate normal populations</i> <i>2. Understand the concept of confidence area and test the vector hypothesis of the mean of more than two multivariate normal populations</i>	normal multivariat 3.2 Dapat menentukan, menghitung dan menganalisis daerah kepercayaan dan uji hipotesis vector rata-rata lebih dari dua populasi normal multivariat baik yang ada peubah pengiring maupun tidak <i>3.1 Can determine, calculate and analyze confidence areas and test the average vector hypothesis of one and two multivariate</i>					

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)
		<i>normal populations</i> 3.2 Can determine, calculate and analyze the confidence area and test the average vector hypothesis of more than two multivariate normal populations, whether there are accompanying variables or not					
4	1. Memahami konsep Analisis Komponen Utama 2. Memahami konsep Analisis Faktor <i>1. Understand the concept of Principal Component Analysis</i> <i>2. Understand the concept of Factor Analysis</i>	4.1. Dapat menentukan, menghitung dan menganalisis data serta penurunan secara teori analisis komponen utama 4.2. Dapat	Tes tulis Tugas 2 Observasi di kelas <i>Writing Test Task 2</i> <i>Observation in class</i>	Ceramah, diskusi dan latihan soal <i>Lectures, discussions and exercise</i> 150 menit <i>150 minutes</i>		Analisis Komponen Utama Analisis Faktor <i>Principal Component Analysis</i> <i>Factor Analysis</i>	5%/20%

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)
		menentukan, menghitung dan menganalisis data serta penurunan secara teori analisis faktor <i>4.1. Can determine, calculate and analyze data and theoretically decrease the main component analysis</i> <i>4.2. Can determine, calculate and analyze data and decrease in factor analysis theory</i>					
5	1. Memahami konsep Analisis Kelompok 2. Memahami konsep Analisis Diskriminan	5.1. Dapat menentukan, menghitung dan menganalisis data serta	Tes tulis Tugas 2 Observasi di kelas	Ceramah, diskusi dan latihan soal <i>Lectures, discussions and</i>		Analisis Kelompok Analisis Diskriminan <i>Group Analysis</i> <i>Discriminant Analysis</i>	5%/25%

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)
	<i>1. Understand the concept of Group Analysis</i> <i>2. Understand the concept of Discriminant Analysis</i>	penurunan secara teori analisis kelompok 5.2. Dapat menentukan, menghitung dan menganalisis data serta penurunan secara teori analisis diskriminan <i>5.1. Can determine, calculate and analyze data and decrease in theoretical group analysis</i> <i>5.2. Can determine, calculate and analyze data and decrease in discriminant analysis theory</i>	<i>Writing Test Task 2</i> <i>Observation in class</i>	<i>exercise</i> 150 menit <i>150 minutes</i>			
6	1. Memahami konsep model pengukuran	6.1. Mampu menjelaskan	Tes tulis Tugas 3	Ceramah, diskusi dan latihan soal		Pengujian asumsi normal multivariate pada	5%/30%

Mg Ke-	Kemampuan akhir tiap tahapan belajar (Sub-CPMK)	Penilaian		Bentuk 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)
	based kovarians first order 2. Memahami konsep model pengukuran based kovarians second order <i>1. Understand the concept of the first order covariance based measurement model</i> <i>2. Understand the concept of the second order covariance based measurement model</i>	pengertian konsep model pengukuran first order 6.2. Mampu menjelaskan pengertian konsep model pengukuran second order <i>6.1. Able to explain the concept of the first order measurement model</i> <i>6.2. Able to explain the concept of second order measurement model</i>	Observasi di kelas <i>Writing Test Task 3</i> <i>Observation in class</i>	<i>Lectures, discussions and exercise</i> 150 menit <i>150 minutes</i>		indicator di variable laten Analisis Faktor Konfirmatori <i>Testing multivariate normal assumptions on indicators in latent variables</i> <i>Confirmatory Factor Analysis</i>	
7	7. Mampu menjelaskan konsep dan teoritis analisis jalur based kovarians <i>7. Able to explain the concept and theory of path</i>	7.1. Mampu menjelaskan tentang analisis jalur dengan 1 variabel intervening. 7.2. Mampu	Tes tulis Tugas 4 Observasi di kelas <i>Writing Test Task 4</i>	Ceramah, diskusi dan latihan soal <i>Lectures, discussions and exercise</i>		Analisis jalur based kovarians dengan 1 variabel intervening <i>Path analysis based on covariance with 1 intervening variable</i>	5%/35%

Mg Ke-	Kemampuan akhir tiap tahapan belajar (Sub-CPMK)	Penilaian		Bentuk 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)
	<i>analysis based on covariance</i>	menentukan pengaruh tidak langsung antar variable laten. 7.3. Mampu menentukan goodness of fit model. 7.4. Mampu menentukan modifikasi model analisis jalur <i>7.1. Able to explain path analysis with 1 intervening variable.</i> <i>7.2. Able to determine the indirect effect between latent variables.</i> <i>7.3. Able to determine the goodness of fit model.</i> <i>7.4. Able to determine the modification of the path analysis model</i>	<i>Observation in class</i>	150 menit <i>150 minutes</i>			

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)
8	8. Mampu menjelaskan konsep dan teoritis analisis jalur based kovarians dengan 2 variabel intervening <i>8. Able to explain the concept and theory of path analysis based on covariance with 2 intervening variables</i>	8.1. Mampu menjelaskan tentang analisis jalur dengan 2 variabel intervening. 8.2. Mampu menentukan pengaruh tidak langsung antar variable laten. 8.3. Mampu menentukan goodness of fit model. 8.4. Mampu menentukan modifikasi model analisis jalur <i>8.1. Able to explain path analysis with 2 intervening variables.</i> <i>8.2. Able to determine the indirect effect between latent variables.</i> <i>8.3. Able to determine the</i>	Tes tulis Tugas 4 Observasi di kelas <i>Writing Test</i> <i>Task 4</i> <i>Observation in class</i>	Ceramah, diskusi dan latihan soal <i>Lectures, discussions and exercise</i> 150 menit <i>150 minutes</i>		Analisis jalur based kovarians dengan 2 variabel intervening <i>Path analysis based on covariance with 2 intervening variables</i>	5%/40%

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)
		<i>goodness of fit model.</i> <i>8.4. Able to determine modification of path analysis model</i>					
9	9. Mampu menjelaskan konsep dan teoritis model persamaan structural based kovarians tanpa variabel intervening <i>9. Be able to explain the concepts and theoretical models of structural equations based on covariance without intervening variables</i>	9.1. Mampu menjelaskan tentang model persamaan structural based kovarians tanpa variabel intervening. 9.2. Mampu menentukan goodness of fit model persamaan structural 9.3. Mampu menentukan modifikasi model persamaan structural <i>9.1. Able to explain the structural equation model based on</i>	Tes tulis Tugas 4 Observasi di kelas <i>Writing Test Task 4 Observation in class</i>	Ceramah, diskusi dan latihan soal <i>Lectures, discussions and exercise</i> 150 menit <i>150 minutes</i>		Model persamaan struktural tanpa variabel intervening <i>Structural equation model without intervening variables</i>	5%/45%

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)
		<i>covariance without intervening variables.</i> 9.2. <i>Able to determine the goodness of fit structural equation model</i> 9.3. <i>Able to determine modification of structural equation model</i>					
10	10. Mampu menjelaskan konsep dan teoritis model persamaan structural based kovarians dengan variabel intervening <i>10. Able to explain the concepts and theoretical models of structural equations based on covariance with intervening variables</i>	10.1. Mampu menjelaskan tentang model persamaan structural based kovarians dengan variabel intervening. 10.2. Mampu menentukan goodness of fit model persamaan structural 10.3. Mampu menentukan	Tes tulis Tugas 1 Observasi di kelas <i>Writing Test Task 1 Observation in class</i>	Ceramah, diskusi dan latihan soal <i>Lectures, discussions and exercise</i> 150 menit <i>150 minutes</i>		Model persamaan struktural dengan variable intervening <i>Structural equation model with intervening variable</i>	5%/50%

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)
		modifikasi model persamaan structural <i>10.1. Able to explain the structural equation model based on covariance with intervening variables.</i> <i>10.2. Able to determine the goodness of fit structural equation model</i> <i>10.3. Able to determine modification of structural equation model</i>					
11	11. Mampu menjelaskan konsep dan teoritis model analisis jalur based kovarians dengan variabel moderating <i>11. Able to explain the concepts and</i>	11.1. Mampu menjelaskan tentang analisis jalur based kovarians dengan variabel moderating. 11.2. Mampu menentukan	Tes tulis Tugas 1 Observasi di kelas <i>Writing Test Task 1</i>	Ceramah, diskusi dan latihan soal <i>Lectures, discussions and exercise</i> 150 menit		Model analisis jalurdengan variable moderating <i>Path analysis model with moderating variable</i>	5%/55%

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)
	<i>theoretical models of path analysis based on covariance with moderating variables</i>	goodness of fit model analisis jalur 11.3. Mampu menentukan modifikasi model analisis jalur <i>11.1. Able to explain about path analysis based on covariance with moderating variables.</i> <i>11.2. Able to determine the goodness of fit path analysis model</i> <i>11.3. Able to determine modification of path analysis model</i>	<i>Observation in class</i>	<i>150 minutes</i>			
12	12. Mampu menjelaskan konsep dan teoritis model persamaan structural based kovarians dengan variabel moderating	12.1. Mampu menjelaskan tentang model persamaan structural based kovarians dengan variabel	Tes tulis Tugas 2 Observasi di kelas	Ceramah, diskusi dan latihan soal <i>Lectures, discussions and exercise</i>		Model persamaan structural dengan variable moderating <i>Structural equation model with moderating variable</i>	10%/65%

Mg Ke-	Kemampuan akhir tiap tahapan belajar (Sub-CPMK)	Penilaian		Bentuk 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)
	12. Able to explain the concepts and theoretical models of structural equations based on covariance with moderating variables	moderating. 12.2. Mampu menentukan goodness of fit model persamaan struktural 12.3. Mampu menentukan modifikasi model persamaan struktural 12.1. Able to explain about structural equation model based on covariance with moderating variable. 12.2. Able to determine the goodness of fit structural equation model 12.3. Able to determine modification of structural equation model	Writing Test Task 2 Observation in class	150 menit 150 minutes			

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)
13	13. Mampu menjelaskan konsep dan teoritis analisis jalur based varians <i>13. Able to explain the concept and theory of path analysis based on variance</i>	13.1. Mampu menjelaskan tentang analisis jalur based variansdengan 1 variabel intervening. 13.2. Mampu menentukan pengaruh tidak langsung antar variable laten.(Sobel Test) 13.3. Mampu menentukan goodness of fit model. <i>13.1. Able to explain about path analysis based on variance with 1 intervening variable.</i> <i>13.2. Able to determine the indirect effect between latent variables. (Sobel Test)</i>	Tes tulis Tugas 2 Observasi di kelas <i>Writing Test Task 2 Observation in class</i>	Ceramah, diskusi dan latihan soal <i>Lectures, discussions and exercise</i> 150 menit <i>150 minutes</i>		Analisis jalur based variansdengan 1 variabel intervening <i>Path analysis based on variance with 1 intervening variable</i>	10%/75%

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)
		13.3. <i>Able to determine the goodness of fit model.</i>					
14	14. Mampu menjelaskan konsep dan teoritis model persamaan structural based varians dengan variabel moderating <i>14. Able to explain the concepts and theoretical models of structural equations based on variance with moderating variables</i>	14.1. Mampu menjelaskan tentang model persamaan structural based varians dengan variabel moderating. 14.2. Mampu menentukan goodness of fit model persamaan struktural <i>14.1. Able to explain about structural equation model based on variance with moderating variable.</i> <i>14.2. Able to determine the goodness of fit structural equation model</i>	Tes tulis Tugas 4 Observasi di kelas <i>Writing Test Task 4 Observation in class</i>	Ceramah, diskusi dan latihan soal <i>Lectures, discussions and exercise</i> 150 menit <i>150 minutes</i>		Model persamaan strukturalbased variansdengan variable moderating <i>Structural equation model based on variance with moderating variable</i>	10%/85%

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)
15	14. Mampu menjelaskan konsep dan teoritis model persamaan structural based distribusi <i>14. Able to explain the concept and theory of structural equation model based on distribution</i>	14.1. Mampu menjelaskan tentang model persamaan structural based distribusi(SEM Bayesian) 14.2. Mampu menentukan goodness of fit model persamaan structural Bayesian <i>14.1. Able to explain about structural equation model based on distribution (Bayesian SEM)</i> <i>14.2. Able to determine goodness of fit Bayesian structural equation model</i>	Tes tulis Tugas 4 Observasi di kelas <i>Writing Test Task 4 Observation in class</i>	Ceramah, diskusi dan latihan soal <i>Lectures, discussions and exercise</i> 150 menit <i>150 minutes</i>		Model persamaan struktural based distribusi(SEM Bayesian) <i>Distribution based structural equation model (Bayesian SEM)</i>	15%/100%