



INSTITUT TEKNOLOGI SEPULUH NOPEMBER
FAKULTAS SAINS DAN ANALITIKA DATA
PROGRAM STUDI MAGISTER STATISTIKA
DEPARTEMEN STATISTIKA

Kode Dokumen

REV-1

RENCANA PEMBELAJARAN SEMESTER

MATA KULIAH (MK)		KODE	Rumpun MK	BOBOT (sks)		SEMESTER	Tgl Penyusunan
Teori Peluang		SS255101	Analitika Data Sosial dan Statistika Oficial	T=3	P=0	I	Agustus 2026
OTORISASI		Pengembang RPS		Koordinator RMK		Kepala PRODI	
		Prof. Dr. Drs. Purhadi, M.Sc.		Prof. Dr. Vita Ratnasari, S.Si, M.Si.		Irhamah, S.Si, M.Si, Ph.D.	
Capaian Pembelajaran (CP) Learning Outcome (LO)	CPL-PRODI yang dibebankan pada MK						
	CPL-4 <i>PLO-4</i>	Mampu menganalisis dan mengintegrasikan Teori Statistika dalam merumuskan metode statistika yang inovatif untuk menyelesaikan permasalahan teoritis dan riil. <i>Able to analyze and integrate statistical theory to formulate innovative statistical methods for solving both theoretical and real-world problems.</i>					
	CPL-8 <i>PLO-8</i>	Mampu menganalisis dan mengevaluasi metode statistika untuk merumuskan solusi pada permasalahan teoritis dan riil dengan pendekatan multidisipliner <i>Able to analyze and evaluate statistical methodologies to formulate solutions for theoretical and real-world problems using a multidisciplinary approach.</i>					
	Capaian Pembelajaran Mata Kuliah (CPMK)						
	CPMK-1	Menguasai konsep, mampu menganalisis dan mengintegrasikan tentang percobaan random, variabel random, ruang probabilitas, fungsi distribusi, distribusi bersyarat dan kebebasan stokastik serta aplikasi dalam metode statistika <i>Mastering the concept, being able to analyze and integrate random experiments, random variables, probability spaces, distribution functions, conditional distribution and stochastic freedom as well as applications in statistical methods</i>					
	CPMK-2	Menguasai konsep, mampu menganalisis dan mengintegrasikan tentang ekspektasi matematika, fungsi pembangkit momen, fungsi karakteristik, konvergensi variabel random serta aplikasi dalam metode statistika <i>Mastering concepts, being able to analyze and integrate mathematical expectations, moment-generating functions, characteristic functions, convergence of random variables and applications in statistical methods</i>					
	CPMK-3	Menguasai konsep, mampu menganalisis dan mengintegrasikan tentang model-model probabilitas, distribusi fungsi variabel random serta aplikasi dalam metode statistika					

		<i>Mastering the concept, being able to analyze and integrate probability models, distribution of random variable functions and applications in statistical methods</i>																																																																															
	CPMK-4	Menguasai konsep, mampu menganalisis dan mengintegrasikan tentang distribusi limit, distribusi sampling, teorema limit pusat serta aplikasi dalam metode statistika <i>Mastering the concept, being able to analyze and integrate probability models, distribution of random variable functions and applications in statistical methods</i>																																																																															
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Deskripsi Singkat MK	Teori Peluang merupakan salah satu mata kuliah keahlian yang merupakan bagian dari bidang kajian dalam Teori statistik. Tujuan mempelajari Teori Peluang adalah untuk menguasai konsep, mampu menganalisis dan mengintegrasikan tentang percobaan random, variabel random, ruang probabilitas, fungsi distribusi, distribusi bersyarat dan kebebasan stokastik, ekspektasi matematika, fungsi pembangkit momen, fungsi karakteristik, konvergensi variabel random, model-model probabilitas, hukum bilangan besar, distribusi fungsi variabel random, distribusi limit, distribusi sampling, teorema limit pusat serta aplikasi dalam metode statistika sehingga mahasiswa akan memiliki pengalaman belajar untuk berfikir secara kritis dan mampu memberikan keputusan yang tepat tentang penggunaan konsep tersebut. Strategi pembelajaran yang digunakan adalah diskusi dan latihan serta tugas. <i>Opportunity Theory is one of the expertise courses that is part of the field of study in Statistical Theory. The purpose of studying Opportunity Theory is to master concepts, be able to analyze and integrate about random experiments, random variables, probability spaces, distribution functions, conditional distribution and stochastic freedom, mathematical expectations, moment-generating functions, characteristic functions, convergence of random variables, probability models, laws of numbers, distribution of random variable functions, limit distribution, sampling distribution, central limit theorem and applications in statistical methods so that students will have learning experience to think critically and be able to make the right decisions about the use of these concepts. The learning strategies used are discussions and exercises as well as assignments.</i>																																																																																
Bahan Kajian: Materi Pembelajaran	Teori Statistika <i>Statistical Theory</i>																																																																																
Pustaka	Utama :		1. Bartoszynski, R. and Bugaj, M.N., 1996, Probability and Statistical Inference, John Wiley & Sons, New York. 2. Bhat, B.R., 1981, Modern Probability Theory, John Wiley & Sons, New York. 3. Hogg, R.V. dan Craig, A.T. 1995. Introduction to Mathematical Statistics, 5th ed. Mac Millon. New York.																																																																														

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)
2-3	beserta teorema-teorema yang dapat diturunkan dari definisi tersebut. <i>2. Be able to explain the definition of axiomatic probability based on the field concept and the theorems that can be derived from the definition.</i>	2.3 Mampu membedakan antara segitiga Pascal, binomial Newton dan menerapkan pada konsep probabilitas 2.4 Mampu menurunkan teorema-teorema probabilitas, probabilitas bersyarat. 2.5 Mampu menjelaskan sifat-sifat independensi mahasiswa mengerti probabilitas total dan teorema bayes <i>2.1 Able to explain, give examples, string the axioms of probability.</i> <i>2.2 Able to distinguish between Pascal's triangle, Newton's binomial and apply them to the concept of probability</i> <i>2.3 Able to derive probability theorems, conditional probabilities.</i> <i>2.4 Able to explain the properties of student independence, understand total probability and Bayes' theorem</i>	Writing test Task 1 Observation in class	Lectures, discussions and exercises 300 Minutes		aksiomatik dan teorema probabilitas Probabilitas bersyarat Sifat independensi Probabilitas total dan bayes <i>Probability: set function</i> <i>Definition of axiomatic probability and probability theorem</i> <i>Conditional probability</i> <i>The properties of independence</i> 1. <i>Total probability and bayes</i>	15%/25%
2-3	3.Mampu menjelaskan pengertian variabel random	3.1 Dapat menerangkan dan memberi contoh tentang fungsi titik, fungsi himpunan, fungsi invers, fungsi terukur, fungsi borel, σ -Field terimbas, variabel random, Variabel random vektor, Variabel random kompleks, limit dari variabel random 3.2 Mampu menjelaskan perbedaan konsep variabel random diskrit dan kontinyu <i>3.1 Able to explain and give examples about point functions, set functions, inverse functions, measurable functions, borel functions, σ-Fields, random variables, vector random variables, complex random variables, limits of random variables</i> <i>3.2 Able to explain the difference between discrete and continuous random variable concepts</i>	Tes tulis Tugas 2 Observasi di kelas Writing test Task 2 Observation in class	Ceramah, diskusi dan latihan soal 150 Menit Lectures, discussions and exercises 150 Minutes		Variabel random : variabel random, variabel random vektor, limit dari variabel random Variabel random diskrit dan kontinyu <i>Random Variables: random variable, vector random variable, limit of random variable</i> Discrete and continuous random variables	10%/35% 10%/35%

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		Indikator	Kriteria & Bentuk	Luring (offline)	Daring (online)		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		<i>Gamma, Exponential, Normal, bivariate normal, beta, Weibull distributions</i>					
7-8	6. Mampu menguasai konsep, menganalisis dan mengintegrasikan ekspektasi matematika , momen, variansi beserta sifat-sifatnya dan ketaksamaan chebyshev	6.1. Mampu menjelaskan pengertian konsep ekspektasi matematika 6.2. Mampu mengetahui kegunaan dan hubungan dari fungsi pembangkit momen, mean, momen, variansi 6.3. Mampu mendapatkan fungsi pembangkit momen, mean, momen, variansi untuk variabel random diskrit 6.4. Mampu menjelaskan kegunaan dan hubungan dari fungsi pembangkit momen, mean, momen, variansi untuk variabel random kontinyu	Tes tulis Tugas 3 Observasi di kelas	Ceramah, diskusi dan latihan soal 300 Menit		Ekspektasi dari variabel random diskrit dan kontinyu	10%/65%
7-8	<i>6. Able to explain the concept of mathematical expectation, moment, variance and their properties and chebyshev inequality</i>	<i>6.1. Able to explain the concept of mathematical expectation</i> <i>6.2. Able to know the usefulness and relationship of moment generating function, mean, moment, variance</i> <i>6.3. Able to get moment generating function, mean, moment, variance for discrete random variable</i> <i>6.4. Able to explain the use and relationship of moment generating function, mean, moment, variance for continuous random variable</i>	<i>writing test</i> <i>Task 3</i> <i>Observation in class</i>	<i>Lectures, discussions and exercises</i> <i>300 Minutes</i>		<i>Expectations of discrete and continuous random variables</i>	10%/65%
9-12	7. Mampu menguasai konsep, menganalisis dan mengintegrasikan distribusi dari variabel random diskrit dan kontinyu	7.1. Mampu menjelaskan tentang distribusi dari variabel random diskrit dan kontinyu. 7.2. Mampu menentukan distribusi dari Variabel random diskrit dan kontinyu. 7.3. Mampu menentukan distribusi dari Variabel random diskrit dan kontinyu. 7.4. Mampu menentukan distribusi sampling 7.5 Mampu menentukan distribusi order statistik 7.5. Mampu menentukan distribusi khi kuadrat, t, dan F	Tes tulis Tugas 4 Observasi di kelas	Ceramah, diskusi dan latihan soal 300 Menit		Distribusi dari variabel random diskrit dan kontinyu, distribusi sampling, order statistik	10%/75%
	<i>7. Able to explain the concept of discrete</i>	<i>7.1. Able to explain the discrete and continuous random variable distribution.</i> <i>7.2. Able to determine the discrete and continuous random variable distribution.</i> <i>7.3. Able to determine the discrete and continuous</i>	<i>writing test</i>			<i>Discrete and</i>	

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		Indikator	Kriteria & Bentuk	Luring (offline)	Daring (online)		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
9-12	<i>and continuous random variable distributions</i>	<i>random variable distribution. 7.4. Able to determine sampling distribution 7.5 Able to determine statistical order distribution 7.5. Able to determine the distribution of chi squared, t, and F</i>	<i>Task 4 Observation in class</i>	<i>Lectures, discussions and exercises 300 Minutes</i>		<i>continuous random variable distributions, sampling distribution, statistical order</i>	10%/75%
13	8. Mampu menguasai konsep, menganalisis dan mengintegrasikan konvergensi variabel random dan konvergensi fungsi distribusi	8. 1 Dapat menerangkan, membandingkan serta mendemonstrasikan : Konvergensi dalam probabilitas Konvergensi almost surely Konvergensi dalam distribusi Konvergensi dalam mean ke-r Teorema konvergensi untuk ekspektasi Teorema Fubini's	Tes tulis Tugas 4 Observasi di kelas	Ceramah, diskusi dan latihan soal 300 Menit		Konvergensi dalam probabilitas Konvergensi almost surely Konvergensi dalam distribusi Konvergensi dalam mean ke-r Teorema konvergensi untuk ekspektasi Teorema Fubini's Weak Convergence, Konvergensi fungsi distribusi dan fungsi karakteristik	10%/85%
13	<i>8. Able to explain the concept of random variable convergence and distribution function convergence</i>	<i>8. 1 Able to explain, compare and demonstrate: Convergence in probability Almost convergence surely Convergence in distribution Convergence in the rth mean Convergence theorem for expectations Fubini's . Theorem</i>	<i>writing test Task 4 Observation in class</i>	<i>Lectures, discussions and exercises 300 Mnutes</i>		<i>Convergence in probability Convergence almost surely Convergence in distribution Convergence in the rth mean Convergence theorem for expectations Fubini's Theorem's Weak Convergence, Convergence of distribution function and characteristic function</i>	10%/85%
14	9. Mampu menguasai konsep,	9.1. Mampu menjelaskan tentang konsep teorema	Tes tulis	Ceramah, diskusi		Teorema limit	5%/90%

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		Indikator	Kriteria & Bentuk	Luring (offline)	Daring (online)		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
14	menganalisis dan mengintegrasikan teorema limit pusat dan hukum bilangan besar <i>9. Able to explain the concept of the central limit theorem and the law of large numbers</i>	limit pusat dan hukum bilangan besar 9.2. Mampu menerapkan konsep teorema limit pusat dan hukum bilangan besar 9.3. Mampu menentukan distribusi dari Rata2 sampel baik Variabel random diskrit dan kontinyu. <i>9.1. Able to explain the concept of the central limit theorem and the law of large numbers</i> <i>9.2. Able to apply the concept of the central limit theorem and the law of large numbers</i> <i>9.3. Able to determine the distribution of the sample mean both discrete and continuous random variables.</i>	Tugas 4 Observasi di kelas <i>writing test</i> <i>Task 4</i> <i>Observation in class</i>	dan latihan soal 150 Menit <i>Lectures, discussions and exercises</i> <i>150 Minutes</i>		pusat Hukum bilangan besar <i>Central limit theorem</i> <i>Law of large numbers</i>	5%/90%
15	10. Mampu menguasai konsep, menganalisis dan mengintegrasikan distribusi limit <i>10. Able to explain the concept of limit distribution</i>	10.1. Mampu menjelaskan tentang konsep distribusi limit 10.2. Mampu menentukan distribusi dari Rata2 sampel baik Variabel random diskrit dan kontinyu <i>10.1. Able to explain the concept of limit distribution</i> <i>10.2. Able to determine the distribution of the sample mean both discrete and continuous random variables</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 150 Menit <i>Lectures, discussions and exercises</i> <i>150 minutes</i>		Distribusi limit <i>Limit distribution</i>	10%/100%