



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

Kode Dokumen

RENCANA PEMBELAJARAN SEMESTER

MATA KULIAH (MK)		KODE	Rumpun MK	BOBOT (sks)		SEMESTER	Tgl Penyusunan
Teori Peluang		SS235101	Statistika Sosial dan Kependudukan	T=3	P=0	1	Februari 2023
OTORISASI		Pengembang RPS		Koordinator RMK		Ketua PRODI	
				Prof. Dr. Drs. I Nyoman Budiantara, M.S		Dr.rer.pol. Dedy Dwi Prastyo, S.Si, M.Si	
Capaian Pembelajaran (CP)	CPL-PRODI yang dibebankan pada MK						
<i>Learning Outcome (LO)</i>	CPL-1 <i>PLO-1</i>	Mampu menunjukkan sikap dan karakter yang mencerminkan: ketakwaan kepada Tuhan Yang Maha Esa, etika dan integritas, berbudi pekerti luhur, peka dan peduli terhadap masalah sosial dan lingkungan, menghargai perbedaan budaya dan kemajemukan, menjunjung tinggi penegakan hukum mendahulukan kepentingan bangsa dan masyarakat luas, melalui kreatifitas dan inovasi, ekselensi, kepemimpinan yang kuat, sinergi, dan potensi lain yang dimiliki untuk mencapai hasil yang maksimal. <i>Able to demonstrate attitudes and characters that reflect: being pious to God Almighty, having ethics and integrity, virtuous character, sensitive and concern with social and environmental issues, respecting cultural differences and pluralism, upholding law enforcement, prioritizing the interests of the nation and the wider community, through creativity and innovation, excellence, strong leadership, synergy, and other potentials to achieve maximum results.</i>					
	CPL-2 <i>PLO-2</i>	Mampu mengembangkan dan memecahkan permasalahan ilmu pengetahuan dan teknologi dalam bidang keilmuan nya melalui riset dengan pendekatan inter atau multidisiplin hingga menghasilkan karya inovatif dan teruji dalam bentuk tesis dan makalah yang telah diterima di jurnal ilmiah nasional terakreditasi atau diterima di seminar internasional bereputasi. <i>Able to develop and solve science and technology problems in their field through research with an inter or multidisciplinary approach to produce innovative and tested works in the form of theses and papers that have been accepted in accredited national journals or accepted at reputable international seminars.</i>					
	CPL-3 <i>PLO-3</i>	Mampu mengelola pembelajaran diri sendiri, dan mengembangkan diri sebagai pribadi pembelajar sepanjang hayat untuk bersaing di tingkat nasional, maupun internasional, dalam rangka berkontribusi nyata untuk menyelesaikan masalah dengan mengimplementasikan teknologi informasi dan komunikasi dan memperhatikan prinsip keberlanjutan. <i>Able to manage their own learning and develop themselves as personal lifelong learners to compete at national and international levels, in order to make a real contribution to solving problems by implementing information and communication technology and paying attention to the principle of sustainability.</i>					
	CPL-4 <i>PLO-4</i>	Mampu menerapkan Teori Statistika pada Metode Statistika. <i>Able to apply Statistical Theory to Statistical Methods</i>					
	CPL-5	Mampu merancang, melaksanakan, dan mengevaluasi pengumpulan data dengan metodologi yang tepat.					

Dosen Pengampu	Prof. Dr. Drs. Purhadi, M.Sc; Dr. Achmad Choiruddin, S.Si, M.Si
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 (offline)	Daring (online)		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	1. Mampu menjelaskan konsep percobaan random, ruang sampel dan kelas peristiwa, field dan σ - field beserta sifat dan perannya dalam Statistika inferensial <i>Able to explain the concept of random experiment, sample space and event class, field and σ -field and their properties and role in inferential statistics</i>	1.1. Mampu menjelaskan dan memberi contoh tentang percobaan random, titik sampel, ruang sampel, peristiwa. 1.2. Mampu menentukan kekonvergenan barisan peristiwa. 1.3. Mampu menghasilkan Field, minimal Field, α-Field, Borel Field dari berbagai peristiwa 1.4. Mampu menjelaskan sifat –sifat field dan σ -field beserta perbedaannya. 1.5. Mampu memberikan contoh riil tentang Field dan σ - Field percobaan random, ruang sampel, peristiwa, kelas peristiwa-peristiwa <i>1.1.Able to explain and give examples of random experiments, sample points, sample spaces, events. 1.2.Able to determine the convergence of a sequence of events. 1.3.Able to get Field, Minimum Field, σ - Field, Borel Field from various events 1.4.Able to explain the properties of fields and σ - fields and their differences. 1.5.Able to provide real examples of Field and σ - Field of random experiments, sample spaces, events, classes of events</i>	Tes tulis Tugas 1 Observasi di kelas <i>Writing test Task 1 Observation in class</i>	Ceramah, diskusi dan latihan soal 150 Menit <i>Lectures, discussions and exercises 150 Minutes</i>		Percobaan random, ruang sampel dan Kelas Peristiwa. Field dan σ - Field. <i>Random experiment, sample space and Event Class. Field and σ - Field.</i>	10%/10% 10%/10%
2-3	2. Mampu menjelaskan definisi probabilitas aksiomatik berdasarkan konsep field beserta teorema-teorema yang dapat diturunkan dari definisi tersebut. <i>2. Be able to explain the definition</i>	2.1 Mampu menerangkan, memberi contoh, merangkaikan aksioma probabilitas. 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>	Tes tulis Tugas 1 Observasi di kelas	Ceramah, diskusi dan latihan soal 300 Menit		Probabilitas: Fungsi himpunan Definisi probabilitas aksiomatik dan teorema probabilitas Probabilitas bersyarat Sifat independensi Probabilitas total dan bayes <i>Probability:</i>	15%/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)
2-3	<i>of axiomatic probability based on the field concept and the theorems that can be derived from the definition.</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>	<i>Writing test</i> <i>Task 1</i> <i>Observation in class</i>	<i>Lectures, discussions and exercises</i> <i>300 Minutes</i>		<i>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, α -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	Tes tulis Tugas 2 Observasi di kelas	Ceramah, diskusi dan latihan soal 150 Menit		Variabel random : variabel random, variabel random vektor, limit dari variabel random Variabel random diskrit dan kontinyu	10%/35%
2-3	<i>3. Able to explain the meaning of random variables</i>	<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>	<i>Writing test</i> <i>Task 2</i> <i>Observation in class</i>	<i>Lectures, discussions and exercises</i> <i>150 Minutes</i>		<i>Random Variables: random variable, vector random variable, limit of random variable</i> <i>Discrete and continuous random variables</i>	10%/35%
4	4.Mampu menjelaskan konsep ruang probabilitas	4.1 Dapat menerangkan, memberi contoh dan membedakan antara ruang probabilitas diskrit, umum dan terimbas 4.2 Dapat menerangkan sifat-sifat kekontinuan, keujudan, ukuran probabilitas bersyarat, counting, Stieltjes, Teorema Kores-pondensi, teorema de Jordan-Hahn <i>4.1 Able to explain, give examples and distinguish</i>	Tes tulis Tugas 2 Observasi di kelas	Ceramah, diskusi dan latihan soal 300 Menit		Ruang probabilitas diskrit, ruang probabilitas umum Ruang probabilitas terimbas Ukuran probabilitas Probabilitas bersyarat, kebebasan komposisi	10%/45%

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		Indikator	Kriteria & Bentuk	Luring (offline)	Daring (online)		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
4	4. Able to explain the concept of probability space	<i>between discrete, general and induced probability spaces</i> 4.2 Able to explain the properties of continuity, existence, conditional probability measures, counting, Stieltjes, Correc-pondence theorem, deJordan-Hahn theorem	writing test Task 2 Observation in class	Lectures, discussions and exercises 300 Minutes		<i>Discrete probability space, general probability space</i> <i>Affected probability space</i> <i>Probability measure</i> <i>Conditional probability, freedom of composition</i>	10%/45%
5-6	5. Mampu menjelaskan konsep distribusi variabel random diskrit dan kontinyu	5.1. Mampu menjelaskan distribusi variabel random diskrit dan kontinyu 5.2. Mampu menjelaskan perbedaan distribusi variabel random diskrit dan kontinyu 5.3. Mampu menentukan fungsi distribusi Binomial, Geometrik, Hipergeometrik, Binomial negative 5.4. Mampu menentukan fungsi distribusi Poisson, Multinomial, Uniform diskrit 5.5. Mampu menentukan fungsi distribusi Uniform, Gamma, Eksponensial, Normal, normal bivariat, beta, weibull. 5.1. Able to explain the discrete and continuous random variable distributions 5.2. Able to explain the difference between discrete and continuous random variable distributions 5.3. Able to determine the function of Binomial, Geometric, Hypergeometric, negative Binomial distributions 5.4. Able to determine function of Poisson, Multinomial, Discrete Uniform distributions 5.5. Able to determine function of Uniform, Gamma, Exponential, Normal, bivariate normal, beta, Weibull distributions	Tes tulis Tugas 2 Observasi di kelas writing test Task 2 Observation in class	Ceramah, diskusi dan latihan soal 300 Menit Lectures, discussions and exercises 300 Minutes		Distribusi variabel random diskrit dan kontinyu Discrete and continuous random variable distributions	10%/55% 10%/55%
7-8	6. Mampu menjelaskan konsep 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	Tes tulis Tugas 3 Observasi di kelas	Ceramah, diskusi dan latihan soal 300 Menit		Ekspektasi dari variabel random diskrit dan kontinyu	10%/65%

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)
7-8	6. Able to explain the concept of mathematical expectation, moment, variance and their properties and chebyshev inequality	random diskrit 6.4. Mampu menjelaskan kegunaan dan hubungan dari fungsi pembangkit momen, mean, momen, variansi untuk variabel random kontinyu 6.1. Able to explain the concept of mathematical expectation 6.2. Able to know the usefulness and relationship of moment generating function, mean, moment, variance 6.3. Able to get moment generating function, mean, moment, variance for discrete random variable 6.4. Able to explain the use and relationship of moment generating function, mean, moment, variance for continuous random variable	writing test Task 3 Observation in class	Lectures, discussions and exercises 300 Minutes		Expectations of discrete and continuous random variables	10%/65%
9-12	7. Mampu menjelaskan konsep 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 7.1. Able to explain the discrete and continuous random variable distribution. 7.2. Able to determine the discrete and continuous random variable distribution. 7.3. Able to determine the discrete and continuous 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	Tes tulis Tugas 4 Observasi di kelas writing test Task 4 Observation in class	Ceramah, diskusi dan latihan soal 300 Menit Lectures, discussions and exercises 300 Minutes		Distribusi dari variabel random diskrit dan kontinyu, distribusi sampling, order statistik Discrete and continuous random variable distributions, sampling distribution, statistical order	10%/75%
13	8. Mampu menjelaskan konsep konvergensi vaiabel random dan konvergensi fungsi distribusi	8. 1 Dapat menerangkan, membandingkan serta mendemonstrasikan : Konvergensi dalam probabilitas	Tes tulis Tugas 4 Observasi di kelas	Ceramah, diskusi dan latihan soal 300 Menit		Konvergensi dalam probabilitas Konvergensi almost	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)
13	8. Able to explain the concept of random variable convergence and distribution function convergence	Konvergensi almot surely Konvergensi dalam distribusi Konvergensi dalam mean ke-r Teorema konvergensi untuk ekspektasi Teorema Fubini's 8. 1 Able to explain, compare and demonstrate: <i>Convergence in probability</i> <i>Almot convergence surely</i> <i>Convergence in distribution</i> <i>Convergence in the rth mean</i> <i>Convergence theorem for expectations</i> <i>Fubini's . Theorem</i>	writing test Task 4 Observation in class	Lectures, discussions and exercises 300 Mnutes		surely Konvergensi dalam distribusi Konvergensi dalam mean ke-r Teorema konvergensi untuk ekspektasi Teorema Fubini's Weak Convergence, Konvergensi fungsi distribusi dan fungsi karakteristik <i>Convergence in probability</i> <i>Convergence almost surely</i> <i>Convergence in distribution</i> <i>Convergence in the rth mean</i> <i>Convergence theorem for expectations</i> <i>Fubini's Theorem's</i> <i>Weak Convergence, Convergence of distribution function and characteristic function</i>	10%/85%
14	9. Mampu menjelaskan konsep teorema limit pusat dan hukum bilangan besar	9.1. Mampu menjelaskan tentang konsep teorema 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.	Tes tulis Tugas 4 Observasi di kelas	Ceramah, diskusi dan latihan soal 150 Menit		Teorema limit pusat Hukum bilangan besar	5%/90%
14	9. Able to explain the concept of the central limit theorem and the law of large numbers	9.1. Able to explain the concept of the central limit theorem and the law of large numbers 9.2. Able to apply the concept of the central limit theorem and the law of large numbers	writing test Task 4 Observation in class	Lectures,		Central limit theorem	5%/90%

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>9.3. Able to determine the distribution of the sample mean both discrete and continuous random variables.</i>		<i>discussions and exercises 150 Minutes</i>		<i>Law of large numbers</i>	
15	10. Mampu menjelaskan konsep distribusi limit	10.1. Mampu menjelaskan tentang konsep distribusi limit 10.2. Mampu menentukan distribusi dari Rata2 sampel baik Variabel random diskrit dan kontinyu	Tes tulis Tugas 4 Observasi di kelas	Ceramah, diskusi dan latihan soal 150 Menit		Distribusi limit	10%/100%
15	<i>10. Able to explain the concept of limit distribution</i>	<i>10.1. Able to explain the concept of limit distribution 10.2. Able to determine the distribution of the sample mean both discrete and continuous random variables</i>	<i>writing test Task 4 Observation in class</i>	<i>Lectures, discussions and exercises 150 minutes</i>		<i>Limit distribution</i>	<i>10%/100%</i>