MODULE HANDBOOK

SPECIAL TOPIC ON THEORETICAL STATISTICS

STATISTICS UNDERGRADUATE PROGRAM
DEPARTMENT OF STATISTICS
FACULTY OF SCIENCE AND DATA ANALYTICS
INSTITUT TEKNOLOGI SEPULUH NOPEMBER
SURABAYA

ENDORSEMENT PAGE

	MODULE HANDBOOK **SPECIAL TOPIC ON THEORETICAL STATISTICS** **STATISTICS UNDERGRADUATE PROGRAM** **DEPARTMENT OF STATISTICS** **INSTITUT TEKNOLOGI SEPULUH NOPEMBER**

Proses *Process*	Penanggung Jawab *Person in Charge*			Tanggal *Date*
	Nama *Name*	Jabatan *Position*	Tanda tangan *Signature*	
Perumus *Preparation*	Prof.Dr. Drs. Purhadi, M.Sc	Dosen *Lecturer*		
Pemeriksa dan Pengendalian *Review and Control*	Dr. Santi Wulan Purnami, S.Si., M.Si; Dr. Wibawati, S.Si, M.Si	Tim kurikulum *Curriculum team*		
Persetujuan *Approval*	Prof.Dr. Drs. Purhadi, M.Sc	Koordinator RMK *Course Cluster Coordinator*		
Penetapan *Determination*	Dr. Kartika Fithriasari, M.Si	Kepala Departemen *Head of Department*		

MODULE HANDBOOK
SPECIAL TOPIC ON THEORETICAL STATISTICS

Module name	SPECIAL TOPIC ON THEORETICAL STATISTICS	
Module level	Undergraduate	
Code	SS234640	
Course (if applicable)	SPECIAL TOPIC ON THEORETICAL STATISTICS	
Semester	7	
Person responsible for the module	Prof.Dr. Drs. Purhadi, M.Sc	
Lecturer	Prof.Dr. Drs. Purhadi, M.Sc	
Language	Bahasa Indonesia and English	
Relation to curriculum	Undergradute degree program, elective, 7th semester.	
Type of teaching, contact hours	Other SCL methode	
Workload	1. Lectures [L]: 3 x 50 = 150 minutes per week. 2. Exercises and Assignments [EA]: 3 x 60 = 180 minutes (3 hours) per week. 3. Independent Learning [IL]: 3 x 60 = 180 minutes (3 hours) per week.	
Credit points	3 credit points (SKS) Equivalent to 4.8 ECTS	
Requirements according to the examination regulations	A student must have attended at least 80% of the lectures to sit in the exams.	
Mandatory prerequisites	-	
Learning outcomes and their corresponding PLOs	CLO.1 Able to explain the concepts of Random Experiment, Random Variable Random, Probability Space, Distribution Function, Expectation Mathematical, Moment Generation Function, Function Characteristics, distribution of discrete random variable functions, function distribution of continuous random variable function CLO.2 Able to formulate Random Variable problems, Probability Space, Distribution Function, Expectation Mathematical, Moment Generation Function, Function Characteristics, distribution of discrete random variable functions, function distribution of continuous random variable function CLO.3 Able to explain the concept of sampling distribution, Statistical order distribution, Law of large numbers, Central limit theorem, Limit	PLO-4 PLO-5

	distribution, estimation, methods of determining estimators, properties of estimators, loss and risk functions, adequacy statistics, family of loss and risk functions, adequacy statistics, Family exponential family, unbiasedness, equivariance, uniformly most powerfull test, unbiasedness for hypothesis testing, linear hypothesis CLO.4 Able to formulate Distribution problems sampling distribution, statistical order distribution, law of large numbers large, central limit theorem, limit distribution, estimation, methods of determining estimators, properties of estimators, loss and risk functions, adequacy statistics, Family of loss and risk functions, adequacy statistics, exponential family, unbiasedness, equivariance, uniformly most powerfull test, unbiasedness for hypothesis testing, linear hypothesis CLO.5 Able to solve sampling distribution, distribution order statistics, Law of large numbers, Limit theorem, central theorem, limit distribution, estimation, methods of determining estimators, properties of estimators, loss and risk functions, adequacy statistics, exponential family, unbiasedness, equivariance, uniformly most powerfull test, unbiasedness for hypothesis testing, linear hypothesis	
Content	Special Topics in Statistics Theory is one of the elective courses that is part of the field of study of statistical theory. The purpose of studying Special Topics in Statistics Theory is to master the concepts of Random Experiments, Random Variables, Probability Space, Distribution Functions, Mathematical Expectations, Moment Generation Functions, Characteristic Functions, distribution of random variable functions. Probability, Distribution Function, Mathematical Expectation, Moment Generation Function, Characteristic Function, distribution of random variable functions function distribution, continuous random variable function distribution, Sampling Distribution, Statistical Order Distribution, Law of Large Numbers, Theorem of Central Limit, Limit Distribution, Point estimation, interval estimation, methods of determining estimators, properties of estimators, loss functions and risk, adequacy statistics, randomness, efficient estimators, hypothesis testing. Hypothesis testing on normal distribution sampling and its application in statistical methods so that students have the learning experience of critical thinking and are able to make the right decisions about the use of these concepts, make the	

	right decisions about the use of these concepts. The learning strategies used are discussion and exercises and assignments
Assessment and its weight	Assignment and Test 1 (25%) Midterm Exam (25%) Assignment and Test 2 (25%) Final Exam (25%)
Media employed	LCD, whiteboard, websites (myITS Classroom), zoom
Reading list	1. -

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

RENCANA PEMBELAJARAN SEMESTER/
SEMESTER LEARNING PLAN

MATA KULIAH (MK)/ *Course*	**KODE/** *Code*	**Rumpun MK/** *Course Group*	**BOBOT (sks)/** *Weight (credit)*		**SEMESTER/** *Semester*	**Tgl Penyusunan/** *Drafting Date*
TOPIK KHUSUS STATISTIKA TEORI / *SPECIAL TOPIC ON THEORETICAL STATISTICS*	SS234640	Statistika Teori dan Pemodelan	**T=3**	**P=0**	VII	Januari 2023

OTORISASI/ *AUTHORIZATION*	**Pengembang RPS/** *RPS Developer*	**Koordinator RMK/** *Course Group Coordinator*	**Ketua PRODI/** *Head of Department*
	Prof.Dr. Drs. Purhadi, M.Sc	Prof.Dr. Drs. Purhadi, M.Sc	Dr. Kartika Fithriasari, M.Si

Capaian Pembelajaran (CP)/ ***Learning Achievement***

CPL-PRODI yang dibebankan pada MK/ ***PLO***

CPL-4	Mampu menerapkan Sains dan Matematika untuk mendukung pemahaman metode statistika
CPL-5	Mampu menerapkan teori statistika pada metode statistika
PLO-4	*Able to apply Science and Mathematics to support understanding of statistical methods*
PLO-5	*Able to apply statistical theory to statistical methods*

Capaian Pembelajaran Mata Kuliah (CPMK)/ ***CLO***

CPMK 1. Mampu menjelaskan konsep Eksperimen Acak, Variabel Acak, Ruang Probabilitas, Fungsi Distribusi, Ekspektasi Matematis, Fungsi Momen Generation, Fungsi Karakteristik, distribusi fungsi variabel acak diskrit, distribusi fungsi fungsi variabel acak kontinu
CPMK 2. Dapat memformulasikan permasalahan Variabel Acak, Ruang Probabilitas, Fungsi Distribusi, Ekspektasi Matematis, Fungsi Momen Generation, Fungsi Karakteristik, distribusi fungsi variabel acak diskrit, distribusi fungsi fungsi variabel acak kontinu
CPMK 3. Dapat menjelaskan konsep Distribusi sampling, Distribusi order statistik , Hukum bilangan besar, Teorema limit pusat, Distribusi limit, penaksiran, metode penentuan penaksir, sifat-sifat penaksir, fungsi kerugian dan resiko, statistik kecukupan, Keluarga eksponensial, ketidakbiasan, equivariance, uniformly most powerfull test, ketidakbiasan untuk uji hipotesis, hipotesis linier

CPMK 4. Dapat memformulasikan permasalahan Distribusi sampling, Distribusi order statistik , Hukum bilangan besar, Teorema limit pusat, Distribusi limit, penaksiran, metode penentuan penaksir, sifat-sifat penaksir, fungsi kerugian dan resiko, statistik kecukupan, Keluarga eksponensial, ketidakbiasan, equivariance, uniformly most powerfull test, ketidakbiasan untuk uji hipotesis, hipotesis linier

CPMK 5. Dapat menyelesaikan Distribusi sampling, Distribusi order statistik , Hukum bilangan besar, Teorema limit pusat, Distribusi limit, penaksiran, metode penentuan penaksir, sifat-sifat penaksir, fungsi kerugian dan resiko, statistik kecukupan, Keluarga eksponensial, ketidakbiasan, equivariance, uniformly most powerfull test, ketidakbiasan untuk uji hipotesis, hipotesis linier

CLO.1 Able to explain the concepts of Random Experiment, Random Variable Random, Probability Space, Distribution Function, Expectation Mathematical, Moment Generation Function, Function Characteristics, distribution of discrete random variable functions, function distribution of continuous random variable function
CLO.2 Able to formulate Random Variable problems, Probability Space, Distribution Function, Expectation Mathematical, Moment Generation Function, Function Characteristics, distribution of discrete random variable functions, function distribution of continuous random variable function
CLO.3 Able to explain the concept of sampling distribution, Statistical order distribution, Law of large numbers, Central limit theorem, Limit distribution, estimation, methods of determining estimators, properties of estimators, loss and risk functions, adequacy statistics, family of loss and risk functions, adequacy statistics, Family exponential family, unbiasedness, equivariance, uniformly most powerfull test, unbiasedness for hypothesis testing, linear hypothesis
CLO.4 Able to formulate Distribution problems
sampling distribution, statistical order distribution, law of large numbers large, central limit theorem, limit distribution, estimation, methods of determining estimators, properties of estimators, loss and risk functions, adequacy statistics, Family of loss and risk functions, adequacy statistics, exponential family, unbiasedness, equivariance, uniformly most powerfull test, unbiasedness for hypothesis testing, linear hypothesis
CLO.5 Able to solve sampling distribution, distribution order statistics, Law of large numbers, Limit theorem, central theorem, limit distribution, estimation, methods of determining
estimators, properties of estimators, loss and risk functions, adequacy statistics, exponential family, unbiasedness, equivariance, uniformly most powerfull test, unbiasedness for hypothesis testing, linear hypothesis

Matrik CPL – CPMK

PLO-CLO Matrix

	CPL-4	CPL-5
CPMK-1	✓	✓
CPMK-2	✓	✓
CPMK-3	✓	✓
CPMK-4	✓	✓
CPMK-5	✓	✓

Deskripsi Singkat MK/ ***Course Description***

Topik Khusus Statistika Teori merupakan salah satu mata kuliah pilihan yang menjadi bagian dari bidang kajian teori statistika. Tujuan mempelajari Topik Khusus Statistika Teori adalah untuk menguasai konsep Eksperimen Acak, Variabel Acak, Ruang Probabilitas, Fungsi Distribusi, Ekspektasi Matematis, Fungsi Momen Generation, Fungsi Karakteristik, distribusi fungsi variabel acak diskrit, distribusi fungsi fungsi variabel acak kontinu, Distribusi Sampling, Distribusi Orde Statistik, Hukum Bilangan Besar, Teorema Limit Pusat, Limit Distribusi, Penaksiran titik, penaksiran interval, metode penentuan penaksir, sifat-sifat penaksir, fungsi kerugian dan resiko, statistik kecukupan, ketakbiasan, penaksir efisien, Pengujian hipotesis. Uji hipotesis pada sampling distribusi normal serta penerapannya dalam metode statistika sehingga

	siswa mempunyai pengalaman belajar berpikir kritis dan mampu memberikan keputusan yang tepat mengenai penggunaan konsep tersebut. Strategi pembelajaran yang digunakan adalah diskusi dan latihan serta tugas *Special Topics in Statistics Theory is one of the elective courses that is part of the field of study of statistical theory. The purpose of studying Special Topics in Statistics Theory is to master the concepts of Random Experiments, Random Variables, Probability Space, Distribution Functions, Mathematical Expectations, Moment Generation Functions, Characteristic Functions, distribution of random variable functions. Probability, Distribution Function, Mathematical Expectation, Moment Generation Function, Characteristic Function, distribution of random variable functions function distribution, continuous random variable function distribution, Sampling Distribution, Statistical Order Distribution, Law of Large Numbers, Theorem of Central Limit, Limit Distribution, Point estimation, interval estimation, methods of determining estimators, properties of estimators, loss functions and risk, adequacy statistics, randomness, efficient estimators, hypothesis testing. Hypothesis testing on normal distribution sampling and its application in statistical methods so that students have the learning experience of critical thinking and are able to make the right decisions about the use of these concepts, make the right decisions about the use of these concepts. The learning strategies used are discussion and exercises and assignments*
Bahan Kajian: Materi Pembelajaran/ ***Course Material***	Praktek Statistika, Teknologi Informasi, Pemrosesan Data, Pemodelan Statistika *Statistical Practice, Information Technology, Data Processing, Statistical Modeling*
Pustaka/ ***References***	**Utama/*Primary*:** 1. -
	Pendukung/*Secondary*: 1. -
Dosen Pengampu/ ***Lecturers***	Prof.Dr. Drs. Purhadi, M.Sc
Matakuliah syarat/ ***Pre-requisite Course***	-

Mg Ke- *Week*	Kemampuan akhir tiap tahapan belajar (Sub-CPMK) *Final capability for each learning step*	Penilaian *Evaluation*		Bantuk Pembelajaran, Metode Pembelajaran, Penugasan Mahasiswa, [Estimasi Waktu] *Learning Format Learning Methods Assignment for Student [Estimated Time]*		Materi Pembelajaran [Pustaka] *Learning Material [References]*	Bobot Penilaian (%) *Evaluation Weight (%)*
		Indikator *Indicator*	Kriteria & Bentuk *Criteria and Format*	Luring *Offline*	Daring *Online*		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1-2	Eksperimen Acak, Variabel Acak, Ruang Probabilitas *Randomized Experiments, Random Variables, Space Probability*						
3	Fungsi Distribusi *Distribution Function*						
4	Ekspektasi Matematis, Fungsi Momen Generation, Fungsi Karakteristik *Mathematical Expectation, Moment Function Generation, Characteristic Function*						
5	Ekspektasi Matematis, Fungsi Momen						

	Generation, Fungsi Karakteristik distribusi Diskrit *Mathematical Expectation, Moment Function Generation, Discrete distribution Characteristic Function*						
6	Ekspektasi Matematis, Fungsi Momen Generation, Fungsi Karakteristik distribusi Diskrit *Mathematical Expectation, Moment Function Generation, Discrete distribution Characteristic Function*						
7	Ekspektasi Matematis, Fungsi Momen Generation, Fungsi Karakteristik distribusi Kontinyu *Mathematical Expectation, Moment Function Generation, Characteristic Function of distribution continuous*						
8	**ETS/*Midterm***						
9	distribusi dari fungsi variabel acak diskrit *distribution of the discrete random variable function*						

10	Distribusi dari fungsi variabel acak kontinyu *Distribution of continuous random variable functions*						
11	Distribusi Sampling, Distribusi Orde Statistik *Sampling Distribution, Statistical Order Distribution*						
12	Hukum Bilangan Besar *Law of Large Numbers*						
13	Teorema Limit Pusat, Limit Distribusi *Central Limit Theorem, Limit Distribution*						
14	Penaksiran titik, penaksiran interval *Point estimation, interval estimation*						
15	Pengujian hipotesis. Uji hipotesis pada sampling distribusi normal *Hypothesis testing on sampling normal distribution*						
16	**Evaluasi Akhir Semester / Ujian Akhir Semester/*Final Exam***						

	RENCANA ASESMEN & EVALUASI *Assessment and Evaluation Plan* Program Studi Sarjana Statistika / *Statistics Undergraduate Program* **TOPIK KHUSUS STATISTIKA TEORI /** *SPECIAL TOPIC ON THEORETICAL STATISTICS*		**RA&E** SLK-40
Kode MK: SS234640 *Course Code: SS234640*	**Bobot sks (T/P):** 3 *CREDITS : 3*	**Rumpun MK:** Statistika Teori dan Pemodelan *Course cluster: Statistical Theory and Modeling*	Smt: VII *Semester VII*
OTORISASI *AUTHORIZATION*	**Penyusun** *Author* Prof.Dr. Drs. Purhadi, M.Sc	**Koordinator RMK** *Coordinator of course cluster* Prof.Dr. Drs. Purhadi, M.Sc	**Kaprodi** *Head of Department* Dr. Kartika F, M.Si.

Mg ke (1)	Sub CP-MK (2)		Bentuk Asesmen (Penilaian) / Evaluation Type (3)	Bobot / Scoring (%) (4)
	No	Kemampuan akhir / Final Capability		
1-2		Eksperimen Acak, Variabel Acak, Ruang Probabilitas *Randomized Experiments, Random Variables, Space Probability*		
3		Fungsi Distribusi *Distribution Function*		
4		Ekspektasi Matematis, Fungsi Momen Generation, Fungsi Karakteristik *Mathematical Expectation, Moment Function Generation, Characteristic Function*		
5		Ekspektasi Matematis, Fungsi Momen Generation, Fungsi Karakteristik distribusi Diskrit *Mathematical Expectation, Moment Function Generation, Discrete distribution Characteristic Function*		
6		Ekspektasi Matematis, Fungsi Momen Generation, Fungsi Karakteristik distribusi Diskrit		

		Mathematical Expectation, Moment Function Generation, Discrete distribution Characteristic Function		
7		Ekspektasi Matematis, Fungsi Momen Generation, Fungsi Karakteristik distribusi Kontinyu *Mathematical Expectation, Moment Function Generation, Characteristic Function of distribution continuous*		
8		Evaluasi Tengah Semester *Mid Semester Evaluation*		
9		distribusi dari fungsi variabel acak diskrit *distribution of the discrete random variable function*		
10		Distribusi dari fungsi variabel acak kontinyu *Distribution of continuous random variable functions*		
11		Distribusi Sampling, Distribusi Orde Statistik *Sampling Distribution, Statistical Order Distribution*		
12		Hukum Bilangan Besar *Law of Large Numbers*		
13		Teorema Limit Pusat, Limit Distribusi *Central Limit Theorem, Limit Distribution*		
14		Penaksiran titik, penaksiran interval *Point estimation, interval estimation*		
15		Pengujian hipotesis. Uji hipotesis pada sampling distribusi normal *Hypothesis testing on sampling normal distribution*		
16		Evaluasi Akhir *Final Evaluation*		
Total Bobot Penilaian				**100%**