00

RENCANA PEMBELAJARAN SEMESTER (RPS)
PROGRAM STUDI S1 PENDIDIKAN TEKNIK BANGUNAN
JURUSAN TEKNIK SIPIL, FAKULTAS TEKNIK, UNIVERSITAS NEGERI PADANG

COURSES	CODE	GROUP OF COURSES	SCU		SEM	VERSION
			Theory	Pract		
Statistics	**SIP285**	Study Program Compulsory Courses	**2**		**3**	**1**
Responsible Lecturer			**the signature of the responsible lecturer** Dr. Nurhasan Syah, M.Pd. NIP. 19601105 198602 1 001			

Information	**Dean of the Faculty of Engineering**	**Head of the Civil Engineering Department**	**Study Program Coordinator Building Engineering Education**
	Dr. Fahmi Rizal, M.Pd., M.T NIP. 195912041985031004	Faisal Ashar, Ph.D. NIP. 19750103 200312 1001	Drs. Revian Body, MSA. NIP. 19600103 198503 1003

Graduate Learning Outcomes	**Learning Achievement of Graduate Study Programs**
	By considering input from all stake holders and the minimum requirements set by ASIIN, the PLO's that must be possessed by graduates from the Bachelor of Education in Building Engineering Study Program are determined as follows: 1. Master *basic knowledge of science* (mathematics, natural sciences) and other scientific disciplines that form the basis of building engineering vocational education field for carrying out professional work *(Knowledge and*

	Understanding). 1.1. Able to implement basic concepts of mathematics and physics to master subjects matter in the field of building engineering vocational education. 1.2. Mastering Statics, Mechanics, Statistics, Technology Materials, and Engineering Drawings as the basic knowledge in the field of building engineering vocational education. 2. Able to identify, formulate, solve, and evaluate various technical problems of buildings as the basic ability for teaching in the field of building engineering vocational education *(Engineering analysis, investigation and assessment)* . 2.1. Able to identify, formulate, solve, and evaluate technical problems in the field of geotechnical and transportation as the basic ability for teaching in the field of building engineering vocational education. 2.2. Able to identify, formulate, solve, and evaluate technical problems in the field of structure and construction management as the basic ability for teaching in the field of building engineering vocational education. 2.3. Able to identify, formulate, solve, and evaluate technical problems in the field of hydrology as the basic ability for teaching in the field of building engineering vocational education. 3. Possess the ability to design building by taking into account environmental, social, health and work safety issues as the basis for teaching in the field of building engineering vocational education *(Engineering design).* 3.1. Able to make design programming by taking into account environmental, social, health and work safety issues, in cooperation with various party related. 3.2. Able to analyze the design by taking into account environmental, social, health and work safety aspects. 3.3. Able to produce design by taking into account environmental, social, health and work safety aspects. 4. Possess social, managerial, team work, and effective communication competencies, entrepreneurial character, environmental insight and life-long learning habits. *(Transferable and soft skills).* 4.1. Possess religious character implemented in personal and professional activities. 4.2. Possess the spirit of nationalism, social sensitivity and environmental insight 4.3. Able to communicate effectively and work in a team.

4.4. Able to transfer science and technology to the community to improve the quality of life
4.5. Possess entrepreneurial character

5. Possess the ability to innovate and adapt to the development of science and technology, and implement it into the learning process of building engineering vocational education field by taking into account non-technical risks that may occur (ethical, ecological, commercial, and industrial impact) *(Engineering practice)*.
   5.1. Able to innovate and use information technology (software) in the field of building engineering vocational education by taking into account the ethical, ecological, commercial and industrial impact.
   5.2. Able to use information technology-based equipment (hardware) in field of building engineering vocational education.
6. Possess a good ability to design, implement and evaluate the learning process in the field of building engineering vocational education *(Educational design)*.
   6.1. Able to design curriculum and learning process of building engineering vocational education.
   6.2. Able to implement, control, evaluate and improve the quality of learning process through research in the field of building engineering vocational education.
   6.3. Able to develop an effective, efficient, and attractive learning media in the field of building engineering vocational education.

Course Learning Outcomes

Learning Achievment of Course (CPMK)

CPMK	CPL
1. Students can explain the general concepts of statistics and identify the data scale of the variables	2.2, 2.3, 6.1, 6.2, 6.3
2. Students can practice presenting data in textual, tabular and graphical ways	2.2, 2.3, 6.1, 6.2, 6.3
3. Students can select, calculate and process research data	2.2, 2.3, 6.1, 6.2, 6.3
4. Students can understand research procedures, statistical data processing and processing	2.2, 2.3, 6.1, 6.2, 6.3
5. Students can understand the testing procedure in statistical testing data	2.2, 2.3, 6.1, 6.2, 6.3

	6. Students can analyze the results of testing statistical data	2.2, 2.3, 6.1, 6.2, 6.3
Short descriptions of course	This course weighs 2 credits of the theory which contains material on statistical data, frequency distribution, the measure of central values, linear and multivariable regression, correlation and covariance, probability, normal distribution, student t-distribution and chi-square, confidence intervals, average estimation, mean and variance, a statistical test of mean and variance.	
References	**Primary (RU) :**	
	1. Sutrisno Hadi, 1963. Statistik III, Yogyakarta : Yasbit Gadjah Mada	
	Proponent (RP)	
	1. Sutrisno Hadi, 1963. Analisis Regresi, Yogyakarta : Yasbit Gadjah Mada. 2. Sutrisno Hadi, 1963. Analisis Varians, Yogyakarta : Yasbit Gadjah Mada 3. Burhan Nurgiyantoro dkk., 2004. Statistik Terapan. Yogyakarta : Gadjah Mada University Press	
Learning Media	**Software:**	**Hardware:**
	SPSS, M. Excell, M. Word	Komputer, LCD Projector dan Papan tulis dan perangkatnya
Team Teaching	Dr. Nurhasan Syah, M.Pd., Dr. Fahmi Rizal, M.Pd., Dr. Indrati Kusuma Ningrum, M.Pd.	
Assessment	UTS, UAS, Quiz, Tugas Mandiri.	
Requirements Subject		

LESSON MATERIAL

Weeks	Competence to be achieved	Study Materials	Learning Methods and Strategies	Assignments / task	Assessment Criteria / Indicators	Rreference
(1)	Students can understand lecture material and lecture contracts	**Introduction to statistics, lecture contracts, lecture syllabus**	Lectures and Discussions	-	1. Attitude 2. Knowledge	RU 1 RP 3
(2)	CPMK-1 Students can collect and create tables and graphs from statistical data	**1. Understanding Statistics** **2. Statistical Functions** **3. Measurement Scale** **4. Qualitative Data and Quantitative Data**	Lectures and Discussions	Independent Work	**1.** Attitude 2. Knowledge	RU 1 RP 3
(3)	CPMK-2 Students can arrange random data into group data (frequency distribution)	**1. Definition of Frequency Distribution** **2. The parts of the frequency distribution** **3. Compilation of frequency distribution** **4. Histogram, polygon, frequency and curve** **5. Types of frequency distribution**	Lecture and Independent Work	Independent Work	**1.** Attitude 2. Knowledge	RU 1 RP 3
(4)	CPMK-2 Students can calculate further data that can represent the overall value in the data.	**1. Understanding the measure of the central value** **2. Types of criteria for the centre value** **3. Calculation of Mean, Median and Mode**	Lecture and Independent Work	Independent Work	**1.** Attitude 2. Knowledge	RU 1 RP 3
(5)	CPMK-2 Students can know the size of the variation or	**Descriptive Statistics Measurement** **1. Central tendency**	Lecture and Independent Work	Independent Work	**1.** Attitude 2. Knowledge	RU 1 RP 3

Weeks	Competence to be achieved	Study Materials	Learning Methods and Strategies	Assignments / task	Assessment Criteria / Indicators	Rreference
	the size of the deviation	**2. Distribution** **3. Position**				
(6)	CPMK-3 Students can calculate simple regression	**Linear Regression** **1. Central tendency** **2. Distribution** **3. Position**	Lecture and Independent Work	Independent Work	**1.** Attitude 2. Knowledge	RU 1 RP 1 RP 3
(7)	CPMK-3 Students can calculate probability values based on the frequency	**1. Probability and random measurement** **2. Probability distribution function**	Lecture and Independent Work	Independent Work	**1.** Attitude 2. Knowledge	RU 1 RP 3
(8)	**Mid-Semester Evaluation through Mid-Semester Examination**					
(9)	CPMK-3 Students can calculate average distribution values for science, technology and industrial applications as well as in measurement survey.	**Normal Distribution** **1. Density function and distribution function** **2. Standard normal distribution**	Lecture and Independent Work	Independent Work	**1.** Attitude 2. Knowledge	RU 1 RP 2 RP 3
(10)	CPMK-3 Students can calculate the average estimate in probability theory and can measure the closeness of the quantity to the real value	**1. Expectations** **2. Precision and Accuracy**	Lecture and Independent Work	Independent Work	**1.** Attitude 2. Knowledge	RU 1 RP 3
(11)	CPMK-4 Students can calculate the average estimate in probability theory and	**1. Covariance and correlation** **2. Covariance, correlation and matrix weights**	Lecture and Independent Work	Independent Work	**1.** Attitude 2. Knowledge	RU 1 RP 2 RP 3

Weeks	Competence to be achieved	Study Materials	Learning Methods and Strategies	Assignments / task	Assessment Criteria / Indicators	Rreference
	can measure the closeness of the quantity to the real value					
(12)	CPMK-5 Students can perform statistical tests using the normal distribution and student t distribution.	**1. Distribution t student** **2. Distribution chi-square**	Lecture and Independent Work	Independent Work	**1.** Attitude 2. Knowledge	RU 1 RP 3
(13)	CPMK-5 Students can calculate statistical data from a sample of population data and estimate probability distribution parameter	**1. Statistical sample** **2. Estimated average** **3. Estimated variance**	Lecture and Independent Work	Independent Work	**1.** Attitude 2. Knowledge	RU 1 RP 1 RP 3
(14)	CPMK-6 Students can estimate parameters by establishing a confidence interval.	**1. Average confidence interval** 2. **Confidence interval of variance**	Lecture and Independent Work	Independent Work	**1.** Attitude 2. Knowledge	RU 1 RP 2 RP 3
(15)	CPMK-6 Students can perform statistical tests from a sample of data from the population and make decisions based on statistical values.	**1. Statistical test** **2. Average statistical test** 3. **Statistical test of variance**	Lecture and Independent Work	Independent Work	**1.** Attitude 2. Knowledge	RU 1 RP 2 RP 3
(16)	**Final Semester Evaluation (Evaluation intended to determine the final achievement of student learning outcomes)**					

Keterkaitan CPMK dengan CPL dan Metode Assesment

	Assesment	Bobot (%)	CPL-1			CPL-2				CPL-3				CPL-4			CPL-5			CPL-6		
			1	2	3	1	2	3	4	1	2	3	4	1	2	3	1	2	3	1	2	3
CPMK 1	QUIZ, UTS, UAS, TUGAS MANDIRI	**90**																				
CPMK 2																						
CPMK 3																						
CPMK 4																						
CPMK 5																						
CPMK 6																						
Kehadiran		**10**																				

TOTAL		**100**	

Komponen Penilaian

Ujian Tengah Semester : 30%

Ujian Akhir Semester : 35%

Quiz, Tugas Mandiri : 25%

Kehadiran : 10%

Total : 100%

Deskripsi Tingkat Penilaian

	Excellent	**Good**	**Satisfy**	**Fail**
Deskripsi	80-100	70-79	51-69	>50
Formulasi	-	-	-	-
Menghitung	-	-	-	-
Analisis	90-100	70-89	51-69	>50

Sistem Penilaian

Nilai Angka	**Nilai Mutu**	**Angka Mutu**	**Sebutan Mutu**	**Nilai Angka**	**Nilai Mutu**	**Angka Mutu**	**Sebutan Mutu**
85 – 100	A	4.0	Dengan pujian	55 – 59	C	2.0	Cukup
80 – 84	A-	3.6	Sangat baik sekali	50 – 54	C-	1.6	Kurang cukup
75 – 79	B+	3.3	Baik sekali	40 – 49	D	1.0	Kurang

70 – 74	B	3.0	Baik	≤ 39	E	0.0	Gagal
65 – 69	B-	2.6	Cukup Baik	-	T	-	Tertunda
60 – 64	C+	2.3	Lebih dari cukup				

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SOAL UJIAN TENGAH SEMESTER (MID TERM)

Matakuliah	:	Statistika
Kode/SKS	:	SIP285 / 2 SKS
Sifat Ujian	:	*Open Book*
Dosen	:	Dr. Nurhasan Syah, M.Pd.
		Dr. Fahmi Rizal, M.Pd., .M.T.
		Dr. Indrati Kusuma Ningrum, M.Pd
Waktu	:	120 Menit
Soal	:	

1. Sebuah badan sertifikasi kelompok pengguna komputer nasional telah melakukan uji kompetensi management lembaga pendidikan komputer di Jakarta. Uji pendahuluan yang terdiri atas 150 pertanyaan pilihan ganda (multiple-choice) telah dilakukan terhadap 25 pengelola (manager) lembaga pendidikan komputer. Jumlah pertanyaan yang berhasil dijawab dengan benar oleh ke-25 pengelola lembaga pendidikan komputer tersebut adalah sebagai berikut **[bobot 30%]:**

102	91	72	98	115	57	89	121	89	124	122	136	105
80	79	64	108	113	83	63	84	96	99	75	97	

a) Buatkan diagram dahan dan daun untuk meringkas data tersebut.
b) Buatkan diagram kotak dan garis (box-and-whisker plot).
c) Adakah data pencilan? Bila ada, sebutkan.

2. Tim sepak bola suatu universitas melakukan pertandingan 55% di dalam kampus dan 45% di luar kampus. Apabila tim bertanding di dalam kampus universitas bersangkutan, peluang untuk menang pertandingan adalah 0.80. Namun apabila pertandingan di lakukan di luar kampus universitas bersangkutan, peluang untuk menang turun menjadi 0.65. Jika tim tersebut menang bertanding di suatu hari Sabtu, berapa peluang bahwa pertandingan itu dilakukan di dalam kampus universitasnya? **[bobot 20 %]**

3. Jumlah unit komputer pribadi (*personal computer*, PC) yang dirakit dan dipasarkan oleh sebuah pabrik perakitan PC bervariasi dari satu bulan ke bulan lainnya. Berdasarkan data 2 tahun terakhir distribusi perakitan dan pemasaran PC dan peluangnya dalam 4 bulan adalah sbb. **[bobot 30%]:**

Jumlah unit PC dirakit dan dipasarkan	300	400	500	600
Peluang	.20	.30	.35	.15

a) Hitung rata-rata (nilai harapan) banyak unit PC dirakit dan dipasarkan per bulan.
b) Hitung ragam *(variance)* dan simpangan baku (*standard deviation*) PC tirakit dan dipasarkan setiap bulan.

4. Nilai rata-rata dan simpangan baku ujian masuk Universitas Bina Nusantara masing-masing adalah 70 dan 15. UbINUS akan menerima peserta ujian yang memiliki nilai 10% terbesar. Berapa nilai batas ujian peserta yang dapat diterima di UbINUS? **[bobot 20%]**

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SOAL UJIAN AKHIR SEMESTER

Matakuliah	:	Statistika
Kode/SKS	:	SIP285 / 2 SKS
Sifat Ujian	:	*Open Book*
Dosen	:	Dr. Nurhasan Syah, M.Pd. Dr. Fahmi Rizal, M.Pd., .M.T. Dr. Indrati Kusuma Ningrum, M.Pd
Waktu	:	120 Menit

Soal 1 (CP: a1, a2, a3; bobot nilai 50%)

Sebuah bangunan ditopang oleh 150 fondasi tiang. Setiap tiang fondasi memiliki kapasitas dukung 100 ton. Untuk memeriksa kapasitas tiang fondasi tersebut, telah dilakukan PDA Test (*pile driving analyzer test*) terhadap 12 tiang fondasi. Hasil pengujian adalah sebagai berikut:

Tiang uji	1	2	3	4	5	6	7	8	9	10	11	12
Kapasitas (ton)	102	95	97	110	93	90	120	118	100	96	92	107

a. Berapakah nilai rerata dan simpangan baku kapasitas dukung tiang fondasi? (Bobot nilai 10%).
b. Tentukan rentang keyakinan dua sisi kapasitas dukung fondasi dengan tingkat keyakinan 90%. (Bobot nilai 20%).
c. Pada tingkat kesalahan (α) 5%, apakah kapasitas dukung tiang fondasi 100 ton tersebut dapat diterima? Tunjukkan dengan melakukan uji hipotesis. (Bobot nilai 20%).

Soal 2 (CP: a1, a2, a3; bobot nilai 50%)

Pada observasi perilaku aliran lalulintas yang dilakukan selama 1 hari atau 24 jam diperoleh data kerapatan (kepadatan) lalulintas dan kecepatan rata-rata aliran lalulintas sebagai berikut:

Kecepatan rata-rata aliran (km/jam)	52	40	60	24	18	40	34	5
Kerapatan lalulintas (kendaraan/km)	4	34	0	14	18	20	10	25

a. Gambarkan grafik (*scatter diagram*) yang menunjukkan hubungan antara kerapatan (kepadatan) lalulintas dan kecepatan rata-rata aliran lalulintas (Bobot nilai 10%).
b. Lakukan regresi linear untuk terhadap pasangan data aliran lalu lintas tersebut. (Bobot nilai 20%).
c. Berapakah nilai koefisien determinasi dan koefisien korelasi regresi linear tersebut? (Bobot nilai 10%).
d. Jelaskan arti dan informasi apa yang dapat Saudra peroleh dari nilai koefisien determinasi atau koefisien korelasi hubungan antara kerapatan (kepadatan) lalulintas dan kecepatan rata-rata aliran lalulintas. (Bobot nilai 10%).

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SOAL QUIZ

Matakuliah	:	STATISTIKA
Kode / SKS	:	SIP285 / 2 SKS
Sifat	:	Close Book
Dosen	:	Dr. Nurhasan Syah, M.Pd.
		Dr. Fahmi Rizal, M.Pd., .M.T.
		Dr. Indrati Kusuma Ningrum, M.Pd

SOAL:

Berikut adalah daftar nilai hasil UTS mata kuliah Statistika

Kelas	Interval	Frekuensi
1	10-19	2
2	20-29	3
3	30-39	6
4	40-49	8
5	50-59	7
6	60-69	10
7	70-79	8
8	80-89	4
9	90-99	2
Jumlah		**50**

Maka carilah:

a. Nilai rata-rata hitung kelas
b. Nilai tengah (Median)
c. Nilai yang sering muncul (Modus)
d. Nilai jarak interkuartil
e. Nilai Koefisien Variasi dan arti dari nilai Koefisien Variasi yang diperoleh.

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SOAL TUGAS MANDIRI

Matakuliah	:	STATISTIKA
Kode / SKS	:	SIP285 / 2 SKS
Sifat	:	Close Book
Dosen	:	Dr. Nurhasan Syah, M.Pd.
		Dr. Fahmi Rizal, M.Pd., .M.T.
		Dr. Indrati Kusuma Ningrum, M.Pd

Soal .

1. Data nilai statistika dasar dari 60 mahasiswa

   90,80,70,80,90,85,75,85,95,65,75,80,90,80,
   65,55,55,55,65,40,50,60,40,40,50,60,50,40,
   55,65,55,65,75,85,95,95,35,45,55,60,70,80,
   90,80,75,65,75,85,75,65,55,65,75,85,75,65,
   50,60,70,75

   Buatlah tabel distribusi frekuensi

2. Diketahui Tabel data hasil nilai pengerjaan tugas matematika siswa dibawah ini:

Nilai Tugas	Frekuensi
65-67	2
68-70	5
71-73	13
74-76	14
77-79	4
80-81	2

Tentukan:

a. Mean, Median, Modus.
b. Simpangan rata-rata, varians dan standar deviasi.