

MODULE HANDBOOK

STATISTICAL QUALITY CONTROL



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

ENDORSEMENT PAGE

	MODULE HANDBOOK STATISTICAL QUALITY CONTROL STATISTICS UNDERGRADUATE PROGRAM DEPARTMENT OF STATISTICS INSTITUT TEKNOLOGI SEPULUH NOPEMBER
---	--

Proses <i>Process</i>	Penanggung Jawab <i>Person in Charge</i>			Tanggal <i>Date</i>
	Nama <i>Name</i>	Jabatan <i>Position</i>	Tanda tangan <i>Signature</i>	
Perumus <i>Preparation</i>	Prof. Dr. Muhammad Mashuri, M. T	Dosen Lecturer		
Pemeriksa dan Pengendalian <i>Review and Control</i>	Dr. Drs Agus Suharsono, MS Dr. Wibawati, S.Si., M.Si. Dr. Muhammad Ahsan, S.Si. Dr. Hidayatul Khusna, S.Si.	Tim kurikulum Curriculum team		
Persetujuan <i>Approval</i>	Dr. Wibawati, S.Si., M.Si.	Koordinator RMK Course Cluster Coordinator		
Penetapan <i>Determination</i>	Dr. Kartika Fithriasari, M.Si	Kepala Departemen Head of Department		

MODULE HANDBOOK

STATISTICAL QUALITY CONTROL

Module name	STATISTICAL QUALITY CONTROL	
Module level	Undergraduate	
Code	SS234415	
Course (if applicable)	STATISTICAL QUALITY CONTROL	
Semester	4	
Person responsible for the module	Prof. Dr. Muhammad Mashuri, M. T	
Lecturer	Dr. Drs Agus Suharsono, MS Dr. Wibawati, S.Si., M.Si. Dr. Muhammad Ahsan, S.Si. Dr. Hidayatul Khusna, S.Si	
Language	Bahasa Indonesia and English	
Relation to curriculum	Undergraduate degree program, mandatory, 4th semester.	
Type of teaching, contact hours	Other SCL Method Non-SCL Method	
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	Introduction to Statistical Methods	
Learning outcomes and their corresponding PLOs	CLO.1 Able to apply the knowledge of statistical quality control CLO.2 Able to design and collect the data using the appropriate statistical quality control method CLO.3 Able to analyze the data using appropriate statistical quality control methods and interpret the results CLO.4 Able to identify, formulate, and solve the problem in statistical quality control at various fields	PLO.6 PLO.6 PLO.8 PLO.9 PLO.10 PLO.8 PLO.9 PLO.10
Content	Statistical Quality Control is a part of the courses in business and industry fields. The objective of this course is to make the	

	students able to select the appropriate statistical methods in monitoring the product quality and process, particularly in the manufacturing industry. The materials are relating to the concept of quality improvement, seven statistics tools to improve the quality, control chart, the calculation of capability process, measurement system analysis, and acceptance sampling design. To complete the objective, the learning strategies used are discussion, presentation and practice, presentation and written test
Assessment and its weight	Assignment(25%) Midterm Exam(25%) Final Exam(25%) Quiz (25%)
Media employed	LCD, whiteboard, websites (myITS Classroom), zoom
Reading list	1. Montgomery, D.C. (2012), Introduction to Statistical Quality Control 7^{ed}, John Wiley and Sons Inc., USA 2. Leavenworth, G.E. and Grant, R.S., 1988. Statistical Quality Control. USA: McGraw-Hill. 3. Besterfield, D.H., (2009), Quality Control 8th, Pearson International Edition, USA 4. Quesenberry, C.P., (1997), SPC Methods for Quality Improvement, John Wiley and Sons Inc., USA 5. Duncan, A.J., (1986), Quality Kontrol and Industrial Statistics 5^{ed}, Irwin, USA

		INSTITUT TEKNOLOGI SEPULUH NOPEMBER FAKULTAS SAINS DAN ANALITIKA DATA DEPARTEMEN STATISTIKA					Kode Dokumen	
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
Statistika Pengontrolan Kualitas / Statistical Quality Control		SS234415	SBI		T=3		IV	20 Februari 2025
OTORISASI/ AUTHORIZATION		Pengembang RPS/ RPS Developer		Koordinator RMK/ Course Group Coordinator		Ketua PRODI/ Head of Department		
		Dr. Muhammad Mashuri, M.T.; Dr. Drs Agus Suharsono, MS; Dr. Wibawati, S.Si., M.Si.; Dr. Muhammad Ahsan, S.Si.; Dr. Hidayatul Khusna, S.Si.		Dr. Muhammad Ahsan, S.Si		Dr.rer.pol. Dedy Prastyo, M.Si.		
Capaian Pembelajaran (CP)/ Learning Achievement	CPL-PRODI yang dibebankan pada MK/ PLO							
	CPL.6	Mampu merancang, mengumpulkan, dan melakukan manajemen data dengan metodologi yang tepat						
	CPL.8	Mampu menggunakan perangkat komputasi modern untuk menyelesaikan permasalahan statistik						
	CPL.9	Mampu menerapkan metode statistika untuk menganalisis permasalahan teoritis dan riil						
	CPL.10	Mampu menerapkan metode statistika Bisnis, Industri, Ekonomi, Sosial, Kesehatan, atau Lingkungan pada permasalahan riil						
	PLO.6	Able to design, collect, and perform data management with the right methodology.						
	PLO.8	Able to use modern computing devices to solve statistical problems.						
	PLO.9	Able to apply statistical methods to analyze theoretical and real problems.						
PLO.10	Able to apply business, industrial, economic, social, health or environmental statistical methods to real problems							
Capaian Pembelajaran Mata Kuliah (CPMK)/ CLO								

	CPMK.1 Mampu menguraikan konsep dasar pengendalian kualitas Statistika CPMK.2 Mampu menganalisis hasil monitoring proses menggunakan berbagai tipe diagram kontrol atribut dan variabel untuk karakteristik kualitas univariat dan multivariat CPMK.3 Mampu menyelidiki dan menelaah kapabilitas proses menggunakan diagram kontrol dan analisis variansi CPMK.4 Mampu menggunakan berbagai rancangan sampling penerimaan untuk karakteristik kualitas yang bersifat variabel dan atribut <i>CLO.1 Able to apply the knowledge of statistical quality control</i> <i>CLO.2 Able to design and collect the data using the appropriate statistical quality control method</i> <i>CLO.3 Able to analyze the data using appropriate statistical quality control methods and interpret the results</i> <i>CLO.4 Able to identify, formulate, and solve the problem in statistical quality control at various fields</i>																														
		Matrik CPL – CPMK <i>PLO-CLO Matrix</i> <table><tr><td>CPMK (CLO)\CPL (PLO)</td><td>CPL-6</td><td>CPL-8</td><td>CPL-9</td><td>CPL-10</td></tr><tr><td>CPMK-1</td><td>✓</td><td></td><td></td><td></td></tr><tr><td>CPMK-2</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr><tr><td>CPMK-3</td><td></td><td>✓</td><td>✓</td><td>✓</td></tr><tr><td>CPMK-4</td><td></td><td>✓</td><td>✓</td><td>✓</td></tr></table>					CPMK (CLO)\CPL (PLO)	CPL-6	CPL-8	CPL-9	CPL-10	CPMK-1	✓				CPMK-2	✓	✓	✓	✓	CPMK-3		✓	✓	✓	CPMK-4		✓	✓	✓
CPMK (CLO)\CPL (PLO)	CPL-6	CPL-8	CPL-9	CPL-10																											
CPMK-1	✓																														
CPMK-2	✓	✓	✓	✓																											
CPMK-3		✓	✓	✓																											
CPMK-4		✓	✓	✓																											
Deskripsi Singkat MK/ Course Description	Mata kuliah Pengendalian Kualitas Statistika (PKS) merupakan bagian dari mata kuliah bidang Bisnis dan Industri. Mata kuliah ini diberikan dengan tujuan agar mahasiswa dapat memilih Metode Statistika yang tepat dalam monitoring kualitas produk dan proses, khususnya di industri manufaktur. Materi yang diberikan adalah konsep peningkatan kualitas, 7 alat statistika untuk peningkatan kualitas, Diagram kendali, perhitungan kapabilitas proses, analisis sistem pengukuran dan rancangan sampling penerimaan. Agar tujuan pembelajaran tercapai maka Strategi Pembelajaran mata kuliah ini adalah diskusi, presentasi dan praktikum, presentasi dan ujian tertulis. <i>Statistical Quality Control is a part of the courses in business and industry fields. The objective of this course is to make the students able to select the appropriate statistical methods in monitoring the product quality and process, particularly in the manufacturing industry. The materials are relating to the concept of quality improvement, seven statistics tools to improve the quality, control chart, the calculation of capability process, measurement system analysis, and acceptance sampling design. To complete the objective, the learning strategies used are discussion, presentation and practice, presentation and written test</i>																														
Bahan Kajian: Materi Pembelajaran/ Course Material	Dasar Sains, Teori Statistika, Pengumpulan Data, Deskripsi dan Eksplorasi, Komputasi dan Data Processing, Pemodelan, Industri dan Bisnis <i>Basic Design, Statistical Theory, Data Collection, Description and Exploration, Computing and Data Procesing, Modeling, Industry and Business</i>																														
Pustaka/	Utama/Primary:																														

References	1. Montgomery, D.C. (2020), Introduction to Statistical Quality Control 8^{ed}, John Wiley and Sons Inc., USA 2. Mitra, A. (2021). Fundamentals of quality control and improvement. 5th ed John Wiley & Sons. Pendukung/<i>Secondary</i>: 3. Leavenworth, G.E. and Grant, R.S., 1988. Statistical Quality Control. USA: McGraw-Hill. 4. Besterfield, D.H., (2009), Quality Control 8th, Pearson International Edition, USA 5. Quesenberry, C.P., (1997), SPC Methods for Quality Improvement, John Wiley and Sons Inc., USA 6. Duncan, A.J., (1986), Quality Kontrol and Industrial Statistics 5^{ed}, Irwin, USA 7. Huwang, L., Yeh, A. B., & Wu, C. W. (2007). Monitoring multivariate process variability for individual observations. Journal of Quality technology, 39(3), 258-278.
Dosen Pengampu/ Lecturers	Dr. Muhammad Mashuri, M.T.; Dr. Drs. Agus Suharsono, MS ; Dr. Wibawati, S.Si., M.Si.; Dr. Muhammad Ahsan, S.Si.; Dr. Hidayatul Khusna, S.Si.
Matakuliah syarat/ Pre-requisite Course	Pengantar Metode Statistika <i>Introduction to Statistical Methods</i>

Mg Ke- Week	Kemampuan akhir tiap tahapan belajar (Sub-CPMK) <i>Final capability for each learning step</i>	Penilaian <i>Evaluation</i>		Bentuk Pembelajaran, Metode Pembelajaran, Penugasan Mahasiswa, [Estimasi Waktu] <i>Learning Format Learning Methods Assignment for Student [Estimated Time]</i>		Materi Pembelajaran [Pustaka] <i>Learning Material [References]</i>	Bobot Penilaian (%) <i>Evaluation Weight (%)</i>
		Indikator <i>Indicator</i>	Kriteria & Bentuk <i>Criteria and Format</i>	Luring <i>Offline</i>	Daring <i>Online</i>		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	Mampu menjelaskan konsep peningkatan kualitas suatu proses <i>Able to explain the concept of quality improvement of the process</i>	a. Dapat menjelaskan Konsep Peningkatan kualitas berkesinambungan Pengertian Statistika Pengendalian Proses (SPC) Quality Design dan quality Conformance 1. <i>Able to explain the theoretical concept relating to the continuous quality improvement. The definition of Statistical Quality Control Quality Design and Quality Conformance</i>	1. Dosen menjelaskan rencana pembelajaran, metode pembelajaran, dan rencana evaluasi. (30 menit) 2. Dosen membagikan kertas kerja yang berisi berbagai studi kasus: Quality improvement, diagram pengendali variable, diagram pengendali atribut, diagram pengendali tipe cusum dan ewma, diagram pengendali multivariat, dan rancangan sampling penerimaan. (15	TM: 3x50" (proses pembelajaran di kelas case based dan diskusi) BK: 3x60" (Penugasan analisis data berbasis studi kasus) BM: 3x60" (Mahasiswa secara mandiri mempelajari konsep dan metode analisis)		Introduction to statistical quality control Referensi: Montgomery, D.C. (2020), Introduction to Statistical Quality Control 8ed, John Wiley and Sons Inc., USA. (Hal 3- 46)	5%/5%

Mg Ke- Week	Kemampuan akhir tiap tahapan belajar (Sub-CPMK) <i>Final capability for each learning step</i>	Penilaian <i>Evaluation</i>		Bentuk Pembelajaran, Metode Pembelajaran, Penugasan Mahasiswa, [Estimasi Waktu] <i>Learning Format Learning Methods Assignment for Student [Estimated Time]</i>		Materi Pembelajaran [Pustaka] <i>Learning Material [References]</i>	Bobot Penilaian (%) <i>Evaluation Weight (%)</i>
		Indikator <i>Indicator</i>	Kriteria & Bentuk <i>Criteria and Format</i>	Luring <i>Offline</i>	Daring <i>Online</i>		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
			menit) 3. Dosen menjelaskan garis besar materi perkuliahan (60 menit). 4. Diskusi pendalaman (45 menit)				
2		a. Menggunakan Tujuh Alat Statistik b. Dapat menjelaskan konsep variasi dan hubungan antara peta kendali dan pengujian hipotesis. c. Dapat mencari sumber penyebab terjadinya out of control <i>a. Able to apply the seven statistics tools.</i> <i>b. Able to explain the concept of variation and the relationship between control chart and hypothesis testing</i> <i>c. Able to define the source of out of control event</i>	Case study 1: 1. Mahasiswa dibagi ke dalam kelompok diskusi @5 mahasiswa. (15 menit) 2. Setiap kelompok mendiskusikan kertas kerja tentang quality improvement studi Kasus Buku Montgomeri hal 208-217. (60 menit) 3. Kelompok terpilih mempresentasikan hasil diskusi dan	TM: 3x50" (proses pembelajaran di kelas case based dan diskusi) BK: 3x60" (Penugasan analisis data berbasis studi kasus) BM: 3x60" (Mahasiswa secara mandiri mempelajari konsep dan metode analisis)		Quality and Quality Improvement Referensi: Montgomery, D.C. (2020), Introduction to Statistical Quality Control 8ed, John Wiley and Sons Inc., USA. (Hal 175-217)	5%/10%

Mg Ke- Week	Kemampuan akhir tiap tahapan belajar (Sub-CPMK) <i>Final capability for each learning step</i>	Penilaian <i>Evaluation</i>		Bantuk Pembelajaran, Metode Pembelajaran, Penugasan Mahasiswa, <i>[Estimasi Waktu]</i> <i>Learning Format Learning Methods Assignment for Student [Estimated Time]</i>		Materi Pembelajaran <i>[Pustaka] Learning Material [References]</i>	Bobot Penilaian (%) <i>Evaluation Weight (%)</i>
		Indikator <i>Indicator</i>	Kriteria & Bentuk <i>Criteria and Format</i>	Luring <i>Offline</i>	Daring <i>Online</i>		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
			memperoleh masukan komentar dan pertanyaan dari kelompok yang lain. (45 menit) 4. Dosen memberikan simpulan hasil diskusi (30 menit).				
3-4	Mampu menerapkan Peta Kendali sesuai dengan permasalahan pada kasus univariat variabel <i>Able to apply a suitable control chart for the univariate problems</i>	a. Dapat menggunakan Tujuh Alat Statistik b. Dapat menjelaskan konsep variasi dan hubungan antara peta kendali dan pengujian hipotesis. c. Dapat mencari sumber penyebab terjadinya out of control <i>a. Able to apply the seven statistics tools b. Able to explain the concept of variation and the relationship between control chart and</i>	Case study 2: 1. Mahasiswa dibagi ke dalam kelompok diskusi @5 mahasiswa. (15 menit) 2. Setiap kelompok mendiskusikan kertas kerja tentang monitoring kualitas Proses Produksi Semen dan PLTU . 3. Kelompok terpilih mempresentasikan	TM: 3x50" (proses pembelajaran di kelas case based dan diskusi) BK: 3x60" (Penugasan analisis data berbasis studi kasus) BM: 3x60" (Mahasiswa secara mandiri mempelajari konsep dan metode analisis)		Xbar – R, X- MR, Xbar-S. Montgomery, D.C. (2020), Introduction to Statistical Quality Control 8ed, John Wiley and Sons Inc., USA. (Hal 218-264)	15%/25%

Mg Ke- Week	Kemampuan akhir tiap tahapan belajar (Sub-CPMK) <i>Final capability for each learning step</i>	Penilaian <i>Evaluation</i>		Bentuk Pembelajaran, Metode Pembelajaran, Penugasan Mahasiswa, <i>[Estimasi Waktu]</i> <i>Learning Format Learning Methods Assignment for Student [Estimated Time]</i>		Materi Pembelajaran <i>[Pustaka] Learning Material [References]</i>	Bobot Penilaian (%) <i>Evaluation Weight (%)</i>
		Indikator <i>Indicator</i>	Kriteria & Bentuk <i>Criteria and Format</i>	Luring <i>Offline</i>	Daring <i>Online</i>		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		<i>hypothesis testing</i> c. <i>Able to define the source of out of control event</i>	hasil diskusi dan memperoleh masukan komentar dan pertanyaan dari kelompok yang lain. (45 menit) 4. Dosen memberikan simpulan hasil diskusi (30 menit).				
5-6	Mampu menerapkan Peta Kendali sesuai dengan permasalahan pada kasus univariat atribut <i>Able to apply a suitable control chart for the univariate problems</i>		Case study 3: 1. Mahasiswa dibagi ke dalam kelompok diskusi @5 mahasiswa. (15 menit) 2. Setiap kelompok mendiskusikan kertas kerja tentang monitoring kualitas Proses Produksi Lemari	TM: 3x50" (proses pembelajaran di kelas case based dan diskusi) BK: 3x60" (Penugasan analisis data berbasis studi kasus) BM: 3x60" (Mahasiswa secara mandiri mempelajari konsep dan metode analisis)		P, np, c, u, demerit, dan Laney p Montgomery, D.C. (2020), Introduction to Statistical Quality Control 8ed, John Wiley and Sons Inc., USA. (Hal 265- 316)	15%/40%

Mg Ke- Week	Kemampuan akhir tiap tahapan belajar (Sub-CPMK) <i>Final capability for each learning step</i>	Penilaian <i>Evaluation</i>		Bantuan Pembelajaran, Metode Pembelajaran, Penugasan Mahasiswa, [Estimasi Waktu] <i>Learning Format Learning Methods Assignment for Student [Estimated Time]</i>		Materi Pembelajaran [Pustaka] <i>Learning Material [References]</i>	Bobot Penilaian (%) <i>Evaluation Weight (%)</i>
		Indikator <i>Indicator</i>	Kriteria & Bentuk <i>Criteria and Format</i>	Luring <i>Offline</i>	Daring <i>Online</i>		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
			ES, Sendok, Kayu lapis. 3. Kelompok terpilih mempresentasikan hasil diskusi dan memperoleh masukan komentar dan pertanyaan dari kelompok yang lain. (45 menit) 4. Dosen memberikan simpulan hasil diskusi (30 menit).				
7	Mampu menentukan Kapabilitas Proses produksi <i>Able to define the capability process of a production</i>	Mengetahui syarat kapabilitas suatu proses <i>Understand the requirement of the capability process</i>	Observasi Aktifitas di kelas <i>Observe the class activity</i>	TM: 3x50" (proses pembelajaran di kelas case based dan diskusi) BK: 3x60" (Penugasan analisis data berbasis studi kasus) BM: 3x60" (Mahasiswa secara mandiri mempelajari konsep dan metode		Cp, Cpk, Cpkm Montgomery, D.C. (2020), Introduction to Statistical Quality Control 8ed, John Wiley and Sons Inc., USA. (Hal 317-338)	10%/50%

Mg Ke- Week	Kemampuan akhir tiap tahapan belajar (Sub-CPMK) <i>Final capability for each learning step</i>	Penilaian <i>Evaluation</i>		Bentuk Pembelajaran, Metode Pembelajaran, Penugasan Mahasiswa, [Estimasi Waktu] <i>Learning Format Learning Methods Assignment for Student [Estimated Time]</i>		Materi Pembelajaran [Pustaka] <i>Learning Material [References]</i>	Bobot Penilaian (%) <i>Evaluation Weight (%)</i>
		Indikator <i>Indicator</i>	Kriteria & Bentuk <i>Criteria and Format</i>	Luring <i>Offline</i>	Daring <i>Online</i>		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
				analisis)			
8	ETS/ <i>Midterm</i>						
9-10	Mampu menerapkan Peta Kendali pada kasus khusus <i>Able to apply the control chart for the particular case</i>	a.Mampu menggunakan diagram kontrol Individu b.Mampu menggunakan Diagram Cusum, Diagram EWMA <i>a.Able to understand the use of Individual control chart b.Able to understand the use of Cusum chart, EWMA chart</i>	Case study 4: 1. Mahasiswa dibagi ke dalam kelompok diskusi @5 mahasiswa. (15 menit) 2. Setiap kelompok mendiskusikan metode jigsaw kertas kerja tentang monitoring kualitas Proses Produksi Semen dan PLTU menggunakan diagram pengendali CUSUM dan EWMA. 3. Kelompok terpilih mempresentasikan hasil diskusi dan memperoleh masukan	TM: 3x50" (proses pembelajaran di kelas case based dan diskusi) BK: 3x60" (Penugasan analisis data berbasis studi kasus) BM: 3x60" (Mahasiswa secara mandiri mempelajari konsep dan metode analisis)		EWMA dan CUSUM Montgomery, D.C. (2020), Introduction to Statistical Quality Control 8ed, John Wiley and Sons Inc., USA. (Hal. 371-402)	10%/60%

Mg Ke- Week	Kemampuan akhir tiap tahapan belajar (Sub-CPMK) <i>Final capability for each learning step</i>	Penilaian <i>Evaluation</i>		Bentuk Pembelajaran, Metode Pembelajaran, Penugasan Mahasiswa, <i>[Estimasi Waktu]</i> <i>Learning Format Learning Methods Assignment for Student [Estimated Time]</i>		Materi Pembelajaran <i>[Pustaka] Learning Material [References]</i>	Bobot Penilaian (%) <i>Evaluation Weight (%)</i>
		Indikator <i>Indicator</i>	Kriteria & Bentuk <i>Criteria and Format</i>	Luring <i>Offline</i>	Daring <i>Online</i>		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
			komentar dan pertanyaan dari kelompok yang lain. (45 menit) 4. Dosen memberikan simpulan hasil diskusi (30 menit).				
11-12		Dapat menerapkan Diagram Kontrol : Diagram T2 Hotteling, Diagram MEWMA <i>Understand the use of: T2 Hotteling control chart, GV control chart</i>	Case study 5: 1. Mahasiswa dibagi ke dalam kelompok diskusi @5 mahasiswa. (15 menit) 2. Setiap kelompok mendiskusikan kertas kerja tentang monitoring kualitas Proses Produksi Semen dan PLTU. 3. Kelompok terpilih mempresentasikan hasil diskusi dan memperoleh	TM: 3x50" (proses pembelajaran di kelas case based dan diskusi) BK: 3x60" (Penugasan analisis data berbasis studi kasus) BM: 3x60" (Mahasiswa secara mandiri mempelajari konsep dan metode analisis)		Montgomery, D.C. (2020), Introduction to Statistical Quality Control 8ed, John Wiley and Sons Inc., USA. (Hal 458-476) Mitra, A. (2021). Fundamentals of quality control and improvement. 5th ed John Wiley & Sons. (Hal. 370- 388) Huwang, L., Yeh, A. B., & Wu, C. W. (2007). Monitoring multivariate process	15%/75%

Mg Ke- Week	Kemampuan akhir tiap tahapan belajar (Sub-CPMK) <i>Final capability for each learning step</i>	Penilaian <i>Evaluation</i>		Bantuk Pembelajaran, Metode Pembelajaran, Penugasan Mahasiswa, <i>[Estimasi Waktu]</i> <i>Learning Format Learning Methods Assignment for Student [Estimated Time]</i>		Materi Pembelajaran <i>[Pustaka] Learning Material [References]</i>	Bobot Penilaian (%) <i>Evaluation Weight (%)</i>
		Indikator <i>Indicator</i>	Kriteria & Bentuk <i>Criteria and Format</i>	Luring <i>Offline</i>	Daring <i>Online</i>		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
			masukan komentar dan pertanyaan dari kelompok yang lain. (45 menit) 4. Dosen memberikan simpulan hasil diskusi (30 menit).			variability for individual observations. Journal of Quality technology, 39(3), 258-278.	
13	Mampu membuat analisis MSA <i>Able to create the Measurement System Analysis</i>	Dapat melakukan measuremen sistem analisis <i>Able to apply the Measurement System Analysis</i>	Observasi Aktifitas di kelas <i>Observe the class activity</i>	TM: 3x50" (proses pembelajaran di kelas case based dan diskusi) BK: 3x60" (Penugasan analisis data berbasis studi kasus) BM: 3x60" (Mahasiswa secara mandiri mempelajari konsep dan metode analisis)		Montgomery, D.C. (2020), Introduction to Statistical Quality Control 8ed, John Wiley and Sons Inc., USA (Hal. 341-367) Mitra, A. (2021). Fundamentals of quality control and improvement. 5th ed John Wiley & Sons. (Hal. 490- 509)	5%/80%
14	Mampu menentukan rancangan sampling dengan Standar	Sampling penerimaan a. Konsep dasar sampling penerimaan	Observasi Aktifitas di kelas <i>Observe the class</i>	TM: 3x50" LT: 3x60" BM: 3x60"		Montgomery, D.C. (2020), Introduction to Statistical Quality	10%/90%

Mg Ke- Week	Kemampuan akhir tiap tahapan belajar (Sub-CPMK) <i>Final capability for each learning step</i>	Penilaian <i>Evaluation</i>		Bentuk Pembelajaran, Metode Pembelajaran, Penugasan Mahasiswa, [Estimasi Waktu] <i>Learning Format Learning Methods Assignment for Student [Estimated Time]</i>		Materi Pembelajaran [Pustaka] <i>Learning Material [References]</i>	Bobot Penilaian (%) <i>Evaluation Weight (%)</i>
		Indikator <i>Indicator</i>	Kriteria & Bentuk <i>Criteria and Format</i>	Luring <i>Offline</i>	Daring <i>Online</i>		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	militer <i>Able to define the sampling design with Military Standard</i>	b. Perancangan sampling tunggal dan sampling ganda <i>Acceptance sampling</i> a. <i>Basic concept of acceptance sampling</i> b. <i>Single acceptance sampling and Double acceptance sampling</i>	<i>activity</i>			Control 8ed, John Wiley and Sons Inc., USA (Hal. 591-626)	
15	Mampu menentukan rancangan sampling dengan Standar militer <i>Able to define the sampling design with Military Standard</i>	Rancangan sampling: a. Mil-Std-105D b. Mil-Std-414 <i>Sampling design:</i> a. <i>Mil-Std-105D</i> b. <i>Mil-Std-414</i>	Observasi Aktifitas di kelas <i>Observe the class activity</i>	TM: 3x50" (proses pembelajaran di kelas case based dan diskusi) BK: 3x60" (Penugasan analisis data berbasis studi kasus) BM: 3x60" (Mahasiswa secara mandiri mempelajari konsep dan metode analisis)		Montgomery, D.C. (2020), Introduction to Statistical Quality Control 8ed, John Wiley and Sons Inc., USA. (Hal. 627-644)	10%/100%
16	Evaluasi Akhir Semester / Ujian Akhir Semester/ <i>Final Exam</i>						

	RENCANA ASESMEN & EVALUASI <i>Assesment and Evaluation Plan</i> Program Studi Sarjana Statistika / <i>Statistics Undergraduate Program</i> STATISTIKA PENGONTROLAN KUALITAS / <i>STATISTICAL QUALITY CONTROL</i>		RA&E
			SLK-15
Kode MK: SS234415 <i>Course Code:</i> SS234415	Bobot sks (T/P): 3 <i>CREDITS : 3</i>	Rumpun MK: Statistika Bisnis dan Industri <i>Course cluster:</i> Business And Industrial Statistics	Smt: IV <i>Semester IV</i>
OTORISASI <i>AUTHORIZATION</i>	Penyusun <i>Author</i>	Koordinator RMK <i>Coordinator of course cluster</i>	Kaprodi <i>Head of Department</i> Dr. Kartika F, M.Si.

Mg ke (1)	Sub CP-MK (2)		Bentuk Asesmen (Penilaian) / <i>Evaluation Type</i> (3)	Bobot / <i>Scoring</i> (%) (4)
	No	Kemampuan akhir / <i>Final Capability</i>		
1		Tuliskan kemampuan akhir Sub CP-MK <i>Write down the final capability of Sub CP-MK</i>	Tuliskan bentuk asesmen <i>Write down the form of assessment</i>	
2				
3				
Total Bobot Penilaian				100%