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 *Process*	Penanggung Jawab *Person in Charge*			Tanggal *Date*
	Nama *Name*	Jabatan *Position*	Tanda tangan *Signature*	
Perumus *Preparation*	Prof. Dr. Muhammad Mashuri, M. T	Dosen Lecturer		
Pemeriksa dan Pengendalian *Review and Control*	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 *Approval*	Dr. Wibawati, S.Si., M.Si.	Koordinator RMK Course Cluster Coordinator		
Penetapan *Determination*	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	Undergradute 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 7ed, 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 5ed, 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	11 Januari 2023

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. Wibawati, S.Si., M.Si.	Dr. Kartika Fithriasari, 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 rill
	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

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

Matrik CPL – CPMK
PLO-CLO Matrix

CPMK	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.

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*
Bahan Kajian: Materi Pembelajaran/ ***Course Material***	Dasar Sains, Teori Statistika, Pengumpulan Data, Deskripsi dan Eksplorasi, Komputasi dan Data Processing, Pemodelan, Industri dan Bisnis *Basic Design, Statistical Theory, Data Collection, Description and Exploration, Computing and Data Procesing, Modeling, Industry and Business*
Pustaka/ ***References***	**Utama/*Primary*:** 1. Montgomery, D.C. (2012), Introduction to Statistical Quality Control 7ed, John Wiley and Sons Inc., USA **Pendukung/*Secondary*:** 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 5ed, Irwin, USA
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 *Introduction to Statistical Methods*

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***	**Materi Pembelajaran [Pustaka]** ***Learning Material [References]***	**Bobot Penilaian (%)** ***Evaluation Weight (%)***

				[Estimated Time]			
		Indikator ***Indicator***	**Kriteria & Bentuk** ***Criteria and Format***	**Luring** ***Offline***	**Daring** ***Online***		
(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
1	Mampu menjelaskan konsep peningkatan kualitas suatu proses *Able to explain the concept of quality improvement of the process*	a. Dapat menjelaskan Konsep Peningkatan kualitas berkesinambungan Pengertian Statistika Pengendalian Proses (SPC) Quality Design dan quality Conformance a. *Able to explain the theoretical concept relating to the continuous quality improvement. The definition of Statistical Quality Control Quality Design and Quality Conformance*	Observasi Aktifitas di kelas *Observe the class activity*	TM: 3x50” LT: 3x60” BM: 3x60”		Montgomery, D.C. (2012), Introduction to Statistical Quality Control 7ed, John Wiley and Sons Inc., USA	5%/5%
2		a. MenggunakanTujuh Alat Statistik b. Dapat menjelaskan konsep variasi dan hubungan antara peta kendali dan pengujian hipotesis. c. Dapat mencari sumber penyebab terjadinya out of control *a. Able to apply the seven statistics tools.* *b. Able to explain the concept of variation and the relationship between control chart and*	Observasi Aktifitas di kelas *Observe the class activity*	TM: 3x50” LT: 3x60” BM: 3x60”		Montgomery, D.C. (2012), Introduction to Statistical Quality Control 7ed, John Wiley and Sons Inc., USA	5%/10%

		hypothesistesting c. *Able to define the source of out of control event*					
3-4	Mampu menerapkan Peta Kendali sesuai dengan permasalahan pada kasus univariat *Able to apply a suitable control chart for the univariate problems*	a. Dapat menggunakanTujuh Alat Statistik b. Dapat menjelaskan konsep variasi dan hubungan antara peta kendali dan pengujian hipotesis. c. Dapat mencari sumber penyebab terjadinya out of control *a. Able to apply the seven statistics tools* *b. Able to explain the concept of variation and the relationship between control chart and hypothesis testing* *c. Able to define the source of out of control event*	Observasi Aktifitas di kelas *Observe the class activity*	TM: 2x3x50" LT: 2x3x60" BM: 2x3x60"		Montgomery, D.C. (2012), Introduction to Statistical Quality Control 7ed, John Wiley and Sons Inc., USA	15%/25%
5-6			Observasi Aktifitas di kelas *Observe the class activity*	TM: 2x3x50" LT: 2x3x60" BM: 2x3x60"		Montgomery, D.C. (2012), Introduction to Statistical Quality Control 7ed, John Wiley and Sons Inc., USA	15%/40%
7	Mampu menentukan Kapabilitas Proses produksi *Able to define the capability process of a production*	Mengetahui syarat kapabilitas suatu proses *Understand the requirement of the capability process*	Observasi Aktifitas di kelas *Observe the class activity*	TM: 3x50" LT: 3x60" BM: 3x60"		Montgomery, D.C. (2012), Introduction to Statistical Quality Control 7ed, John Wiley and Sons Inc., USA	10%/50%
8	**ETS/*Midterm***						
9-10	Mampu menerapkan Peta Kendali pada kasus khusus *Able to apply the control chart for the particular case*	a. Mampu menggunakan diagram kontrol Individu b. Mampu menggunakan Diagram Cusum, Diagram EWMA, Demerit *a. Able to understand the use of Individual control chart* *b. Able to understand the use of Cusum chart, EWMA chart*	Observasi Aktifitas di kelas *Observe the class activity*	TM: 2x3x50" LT: 2x3x60" BM: 2x3x60"		Montgomery, D.C. (2012), Introduction to Statistical Quality Control 7ed, John Wiley and Sons Inc., USA	10%/60%

11-12		Dapat menerapkan Diagram Kontrol : Diagram T2 Hotteling, Diagram GV *Understand the use of:* *T2 Hotteling control chart,* *GV control chart*	Observasi Aktifitas di kelas *Observe the class activity*	TM: 2x3x50” LT: 2x3x60” BM: 2x3x60”		Montgomery, D.C. (2012), Introduction to Statistical Quality Control 7ed, John Wiley and Sons Inc., USA	15%/75%
13	Mampu membuat analisis MSA *Able to create the Measurement System Analysis*	Dapat melakukan measuremen sistem analisis *Able to apply the Measurement System Analysis*	Observasi Aktifitas di kelas *Observe the class activity*	TM: 3x50” LT: 3x60” BM: 3x60”		Montgomery, D.C. (2012), Introduction to Statistical Quality Control 7ed, John Wiley and Sons Inc., USA	5%/80%
14	Mampu menentukan rancangan sampling dengan Standar militer *Able to define the sampling design with Military Standard*	Sampling penerimaan a. Konsep dasar sampling penerimaan b. Perancangan sampling tunggal dan sampling ganda *Acceptance sampling* *a. Basic concept of acceptance sampling* *b. Single acceptance sampling and Double acceptance sampling*	Observasi Aktifitas di kelas *Observe the class activity*	TM: 3x50” LT: 3x60” BM: 3x60”		Montgomery, D.C. (2012), Introduction to Statistical Quality Control 7ed, John Wiley and Sons Inc., USA	10%/90%
15	Mampu menentukan rancangan sampling dengan Standar militer *Able to define the sampling design with Military Standard*	Rancangan sampling: a. Mil-Std-105D b. Mil-Std-414 *Sampling design:* *a. Mil-Std-105D* *b. Mil-Std-414*	Observasi Aktifitas di kelas *Observe the class activity*	TM: 3x50” LT: 3x60” BM: 3x60”		Montgomery, D.C. (2012), Introduction to Statistical Quality Control 7ed, John Wiley and Sons Inc., USA	10%/100%
16	**Evaluasi Akhir Semester / Ujian Akhir Semester/*Final Exam***						