

MODULE HANDBOOK
SIX SIGMA



**BACHELOR DEGREE PROGRAM
DEPARTEMENT OF STATISTICS
FACULTY OF SCIENCE AND DATA ANALYTICS
INSTITUT TEKNOLOGI SEPULUH NOPEMBER**

ENDORSEMENT PAGE



**MODULE HANDBOOK
SIX SIGMA
DEPARTMENT OF STATISTICS
INSTITUT TEKNOLOGI SEPULUH NOPEMBER**

Proses Process	Penanggung Jawab Person in Charge			Tanggal Date
	Nama Name	Jabatan Position	Tandatangan Signature	
Perumus <i>Preparation</i>		Dosen <i>Lecturer</i>		March 28, 2019
Pemeriksa dan Pengendalian <i>Review and Control</i>		Tim kurikulum <i>Curriculum team</i>		April 15, 2019
Persetujuan <i>Approval</i>		Koordinator RMK <i>Course Cluster Coordinator</i>		July 17, 2019
Penetapan <i>Determination</i>	Dr. Kartika Fithriasari, M.Si	Kepala Departemen <i>Head of Department</i>		July 30, 2019

MODULE HANDBOOK

SIX SIGMA

Module name	Six Sigma	
Module level	Undergraduate	
Code	KS184632	
Course (if applicable)	Six Sigma	
Semester	Sixth Semester (Genap)	
Person responsible for the module		
Lecturer		
Language	Bahasa Indonesia and English	
Relation to curriculum	Undergraduate degree program, mandatory , 6 th semester.	
Type of teaching, contact hours	Lectures, <50 students	
Workload	<ol style="list-style-type: none"> 1. Lectures : 3 x 50 = 150 minutes per week. 2. Exercises and Assignments : 3 x 60 = 180 minutes (3 hours) perweek. 3. Private learning : 3 x 60 = 180 minutes (3 hours) per week. 	
Credit points	3 credit points (SKS)	
Requirements according to the examination regulations	A student must have attended at least 80% of the lectures to sit in the exams.	
Mandatory prerequisites	Pengantar Metode Statistika/ <i>Introduction to Statistical Methods</i> Teknik Pengendalian Kualitas/ <i>Quality Control Techniques</i>	
Learning outcomes and their corresponding PLOs	<p><i>CLO.1 Understanding the six sigma concepts used to solve the company's problems</i></p> <p><i>CLO.2 Able to design and carry out data collection with the correct Six Sigma methodology</i></p> <p><i>CLO.3 Identify and formulate quality issues into six sigma</i></p> <p><i>CLO.4 Analyze quality problems with the six sigma method</i></p> <p><i>CLO.5 Evaluating the right six sigma method for company problems</i></p> <p><i>CLO.6 Have knowledge of current and upcoming issues related to the Six Sigma field</i></p> <p><i>CLO.7 Able to communicate effectively and cooperate in interdisciplinary and multidisciplinary teams</i></p> <p><i>CLO.8 Has professional responsibilities and ethics</i></p> <p><i>CLO.9 Able to motivate yourself to think creatively and</i></p>	<p>PLO – 1</p> <p>PLO – 2</p> <p>PLO – 3</p> <p>PLO – 4</p>

	<i>learn throughout life</i>
Content	<i>Each company aims to get the most profit by providing the best service to customers and all stakeholders. The challenge is how businesses can design and run work programs effectively and efficiently. Also how to perform continuous improvement steps. Six Sigma helps solve problems in various systems that are continuous process improvement. Topics covered include: continuous process improvement concept, sigma size, organization - leadership belt, DMAIC methodology, DMADV, six sigma program used to solve problems faced both in the production system environment and services.</i>
Study and examination requirements and forms of examination	<ul style="list-style-type: none"> • In-class exercises • Assignment 1, 2, 3 • Mid-term examination • Final examination
Media employed	LCD, whiteboard, websites (myITS Classroom), zoom.
Reading list	<ol style="list-style-type: none"> 1. Gasperz, Vincent. 2007. Lean Six Sigma for Manufacturing and Service Industries. 2. Gasperz, Vincent. 2008. The Executive Guide to Implementing Lean Six Sigma. 3. Matin, James W. 2006. Lean Six Sigma for Supply Chain Management. Mc Graw Hill. 4. Pyzdek, Thomas. 2014. The Six Sigma Handbook. 4th edition. USA : Mc Graw Hill.



RP-S1	Program Studi	Sarjana, Departemen Statistika, FMKSD-ITS
	Mata Kuliah	Six Sigma
	Kode Mata Kuliah	KS184632
	Semester/SKS	VI/3
	MK Prasyarat	Pengantar Metode Statistika, Teknik Pengendalian Kualitas
	Dosen Pengampu	

Bahan Kajian/Learning Materials	
CPL yang dibebankan MK <i>PLO</i>	<p>CPL-1 Mampu menerapkan pengetahuan teori statistika, matematika, dan komputasi</p> <p>CPL-2 Mampu merancang dan melaksanakan pengumpulan data dengan metodologi yang benar</p> <p>CPL-3 Mampu menganalisis data dengan metode statistika yang tepat dan menginterpretasikannya</p> <p>CPL-4 Mampu mengidentifikasi, memformulasi, dan menyelesaikan masalah statistika di berbagai bidang terapan</p> <p><i>CPL-1 Able to apply statistical, mathematical, and computational theory knowledge</i></p> <p><i>CPL-2 Able to design and implement data collection with the correct methodology</i></p> <p><i>CPL-3 Able to analyze data with the right statistical methods and interpret it</i></p> <p><i>CPL-4 Able to identify, formulate, and solve statistical problems in various applied fields</i></p>
CP-MK <i>CLO</i>	<p>CLO.1 Memahami konsep-konsep six sigma yang digunakan untuk menyelesaikan permasalahan perusahaan</p> <p>CLO.2 Mampu merancang dan melaksanakan pengumpulan data dengan metodologi Six Sigma yang benar</p> <p>CLO.3 Mengidentifikasi dan memformulasikan permasalahan kualitas ke dalam six sigma</p> <p>CLO.4 Melakukan analisis permasalahan kualitas dengan metode six sigma</p> <p>CLO.5 Melakukan evaluasi metode six sigma yang tepat untuk permasalahan perusahaan</p> <p>CLO.6 Memiliki pengetahuan tentang isu terkini dan mendatang yang berkaitan dengan bidang Six Sigma</p> <p>CLO.7 Mampu berkomunikasi secara efektif dan bekerjasama dalam tim yang interdisiplin dan multidisiplin</p> <p>CLO.8 Memiliki tanggung jawab dan etika profesi</p> <p>CLO.9 Mampu memotivasi diri untuk berpikir kreatif dan belajar sepanjang hayat</p> <p><i>CLO.1 Understanding the six sigma concepts used to solve the company's problems</i></p> <p><i>CLO.2 Able to design and carry out data collection with the correct Six Sigma methodology</i></p> <p><i>CLO.3 Identify and formulate quality issues into six sigma</i></p> <p><i>CLO.4 Analyze quality problems with the six sigma method</i></p> <p><i>CLO.5 Evaluating the right six sigma method for company problems</i></p> <p><i>CLO.6 Have knowledge of current and upcoming issues related to the Six Sigma field</i></p> <p><i>CLO.7 Able to communicate effectively and cooperate in interdisciplinary and multidisciplinary teams</i></p> <p><i>CLO.8 Has professional responsibilities and ethics</i></p> <p><i>CLO.9 Able to motivate yourself to think creatively and learn throughout life</i></p>



	Program Studi	Sarjana, Departemen Statistika, FMKSD-ITS
	Mata Kuliah	Six Sigma
	Kode Mata Kuliah	KS184632
	Semester/SKS	VI/3
	MK Prasyarat	Pengantar Metode Statistika, Teknik Pengendalian Kualitas
RP-S1	Dosen Pengampu	


Pertemuan	Kemampuan Akhir Sub CP-MK	Keluasan (materi pembelajaran)	Metode Pembelajaran	Estimasi Waktu	Bentuk Evaluasi	Kriteria dan Indikator Penilaian	Bobot Penilaian
1	1. Memahami konsep-konsep six sigma yang digunakan untuk menyelesaikan permasalahan perusahaan 2. Mengidentifikasi dan memformulasikan permasalahan kualitas ke dalam six sigma 3. Melakukan analisis permasalahan kualitas dengan metode six sigma	<ul style="list-style-type: none"> - Konsep umum sistem kualitas - Identifikasi semua kebutuhan fungsional kualitas - <i>General concept of quality systems</i> - <i>Identify all quality functional needs</i> 	Ceramah Interaksi, Diskusi, Latihan <i>Interaction Lectures, Discussions, Exercises</i>	150 menit <i>150 minutes</i>	Tugas, diskusi, presentasi <i>Tasks, discussions, presentations</i>	<ul style="list-style-type: none"> - Mampu menjelaskan konsep umum sistem kualitas - Mampu mengidentifikasi semua kebutuhan fungsional kualitas - <i>Able to explain the general concept of quality systems</i> - <i>Able to identify all quality functional needs</i> 	5%/5%
2	4. Melakukan evaluasi metode six sigma yang tepat untuk permasalahan perusahaan <i>1. Understand the six sigma concepts used to</i>	<ul style="list-style-type: none"> - Metode quality improvement - Konsep dasar sistem pengembangan kualitas - <i>Quality improvement method</i> 	Ceramah Interaksi, Diskusi, Latihan <i>Interaction Lectures, Discussions, Exercises</i>	150 menit <i>150 minutes</i>	Tugas, diskusi, presentasi <i>Tasks, discussions, presentations</i>	<ul style="list-style-type: none"> - Mampu menjelaskan metode quality improvement - Mampu menjelaskan konsep dasar sistem pengembangan kualitas - <i>Able to explain quality improvement method</i> - <i>Able to explain the basic concept of</i> 	5%/10%



	Program Studi	Sarjana, Departemen Statistika, FMKSD-ITS
	Mata Kuliah	Six Sigma
	Kode Mata Kuliah	KS184632
	Semester/SKS	VI/3
	MK Prasyarat	Pengantar Metode Statistika, Teknik Pengendalian Kualitas
RP-S1	Dosen Pengampu	

	<i>solve the company's problems</i>	- <i>Basic concept of quality development system</i>				<i>quality development system</i>	
3	<i>2. Identify and formulate quality issues into six sigma</i> <i>3. Analyze quality problems with the six sigma method</i> <i>4. Evaluate the right six sigma method for the company's problems</i>	- Pemahaman karakteristik produk dan servis - Pengembangan produk dan servis - <i>Understanding product and service characteristics</i> - <i>Product and service development</i>	Ceramah Interaksi, Diskusi, Latihan <i>Interaction Lectures, Discussions, Exercises</i>	150 menit <i>150 minutes</i>	Tugas, diskusi, presentasi <i>Tasks, discussions, presentations</i>	- Mampu menjelaskan karakteristik produk dan servis - Mampu menjelaskan cara mengembangkan produk dan servis - <i>Able to explain product and service characteristics</i> - <i>Able to explain how to develop products and services</i>	5%/15%
4		Layanan dalam konteks six-sigma, komponen dan karakteristik yang akan dikembangkan dengan metode: - DMAIC - DMADV <i>Services in the context of six-sigma, components and characteristics to be developed by methods:</i> - <i>DMAIC</i> - <i>DMADV</i>	Ceramah Interaksi, Diskusi, Latihan <i>Interaction Lectures, Discussions, Exercises</i>	150 menit <i>150 minutes</i>	Tugas, diskusi, presentasi <i>Tasks, discussions, presentations</i>	Mampu menerapkan metode DMAIC dan DMADV untuk studi kasus tertentu <i>Able to apply DMAIC and DMADV methods for specific case studies</i>	10%/25%




 RP-S1	Program Studi	Sarjana, Departemen Statistika, FMKSD-ITS
	Mata Kuliah	Six Sigma
	Kode Mata Kuliah	KS184632
	Semester/SKS	VI/3
	MK Prasyarat	Pengantar Metode Statistika, Teknik Pengendalian Kualitas
Dosen Pengampu		

5		Problem solving tools <i>Problem solving tools</i>	Ceramah Interaksi, Diskusi, Latihan <i>Interaction Lectures, Discussions, Exercises</i>	150 menit <i>150 minutes</i>	Tugas, diskusi, presentasi <i>Tasks, discussions, presentations</i>	Mampu menerapkan problem solving tools untuk studi kasus tertentu <i>Able to apply problem solving tools for certain case studies</i>	10%/35%
6		7 tools <i>7 Tools</i>	Ceramah Interaksi, Diskusi, Latihan <i>Interaction Lectures, Discussions, Exercises</i>	150 menit <i>150 minutes</i>	Tugas, diskusi, presentasi <i>Tasks, discussions, presentations</i>	Mampu menerapkan 7 tools untuk studi kasus tertentu <i>Able to apply 7 tools for specific case studies</i>	10%/45%
7		Knowledge discovery <i>Knowledge discovery</i>	Ceramah Interaksi, Diskusi, Latihan <i>Interaction Lectures, Discussions, Exercises</i>	150 menit <i>150 minutes</i>	Tugas, diskusi, presentasi <i>Tasks, discussions, presentations</i>	Mampu menerapkan metode knowledge discovery untuk studi kasus tertentu <i>Able to apply knowledge discovery method for certain case studies</i>	10%/55%
8		ETS/Midterm					
9		<ul style="list-style-type: none"> - Six sigma leadership - Macam-macam tingkatan belt dalam organisasi six sigma - <i>Six sigma leadership</i> - <i>Various belt levels in six sigma organization</i> 	Ceramah Interaksi, Diskusi, Latihan <i>Interaction Lectures, Discussions, Exercises</i>	150 menit <i>150 minutes</i>	Tugas, diskusi, presentasi <i>Tasks, discussions, presentations</i>	<ul style="list-style-type: none"> - Mampu menjelaskan six sigma leadership - Mampu menjelaskan tingkatan belt dalam organisasi six sigma - <i>Able to explain six sigma leadership</i> 	5%/60%



RP-S1	Program Studi	Sarjana, Departemen Statistika, FMKSD-ITS
	Mata Kuliah	Six Sigma
	Kode Mata Kuliah	KS184632
	Semester/SKS	VI/3
	MK Prasyarat	Pengantar Metode Statistika, Teknik Pengendalian Kualitas
Dosen Pengampu		

						<ul style="list-style-type: none"> - <i>Able to explain belt level in six sigma organization</i> 	
10-11		<ul style="list-style-type: none"> - Managing six sigma project - Performance measurement - Benefit-cost analysis - <i>Managing six sigma project</i> - <i>Performance measurement</i> - <i>Benefit-cost analysis</i> 	Ceramah Interaksi, Diskusi, Latihan <i>Interaction Lectures, Discussions, Exercises</i>	300 menit <i>300 minutes</i>	Tugas, diskusi, presentasi <i>Tasks, discussions, presentations</i>	<ul style="list-style-type: none"> - Mampu menjelaskan langkah melaksanakan six sigma project - Mampu menjalankan six sigma project untuk studi kasus tertentu - <i>Able to explain the steps of implementing the six sigma project</i> - <i>Able to run six sigma project for specific case studies</i> 	15%/75%
12-13		<ul style="list-style-type: none"> - Prinsip pengukuran dan data - Reliabilitas dan validitas data - R&R studi - <i>Measurement and data principles</i> - <i>Reliability and validity of data</i> - <i>R&R studies</i> 	Ceramah Interaksi, Diskusi, Latihan <i>Interaction Lectures, Discussions, Exercises</i>	300 menit <i>300 minutes</i>	Tugas, diskusi, presentasi <i>Tasks, discussions, presentations</i>	<ul style="list-style-type: none"> - Mampu menjelaskan prinsip pengukuran dan data - Mampu menguji reliabilitas dan validitas data - <i>Able to explain the principles of measurement and data</i> - <i>Able to test the reliability and validity of data</i> 	10%/85%

	Program Studi	Sarjana, Departemen Statistika, FMKSD-ITS
	Mata Kuliah	Six Sigma
	Kode Mata Kuliah	KS184632
	Semester/SKS	VI/3
	MK Prasyarat	Pengantar Metode Statistika, Teknik Pengendalian Kualitas
RP-S1	Dosen Pengampu	

14-15	<ul style="list-style-type: none"> - Six sigma in marketing - Six sigma in project - Six sigma in financing - Six sigma performance control - <i>Six sigma in marketing</i> - <i>Six sigma in project</i> - <i>Six sigma in financing</i> - <i>Six sigma performance control</i> 	Ceramah Interaksi, Diskusi, Latihan <i>Interaction Lectures, Discussions, Exercises</i>	300 menit <i>300 minutes</i>	Tugas, diskusi, presentasi <i>Tasks, discussions, presentations</i>	Mampu menerapkan konsep six sigma dalam marketing, finansial, project dan performance control <i>Able to apply the concept of six sigma in marketing, finance, project and performance control</i>	15%/100%
16	EAS/Finalterm					

PUSTAKA/References :

1. Thomas pyzdek. 2014. The Six Sigma Handbook, Fouth Edition. USA : Mc Graw Hill.
2. James W. Matin. 2006. Lean Six Sigma for Supply Chain Management. Mc Graw Hill
3. Vincent Gasperz. 2007. Lean Six Sigma for Manufacturing and Service Industries.
4. Vincent Gasperz. 2008. The Executive Guide to Implementing Lean Six Sigma.