MODULE HANDBOOK

TIME SERIES ANALYSIS

BACHELOR DEGREE PROGRAM
DEPARTMENT OF STATISTICS
FACULTY OF SCIENCE AND DATA ANALYTICS
INSTITUT TEKNOLOGI SEPULUH NOPEMBER
SURABAYA, INDONESIA

ENDORSEMENT PAGE

	MODULE HANDBOOK **TIME SERIES ANALYSIS** **DEPARTMENT OF STATISTICS** **INSTITUT TEKNOLOGI SEPULUH NOPEMBER**

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

MODULE HANDBOOK

TIME SERIES ANALYSIS

Module name	**Time Series Analysis**	
Module level	Undergraduate	
Code	KS184617	
Course (if applicable)	Time Series Analysis	
Semester	6 (Even)	
Person responsible for the module	Dr. Hidayatul Khusna, S.Si.	
Lecturer	Dr. Hidayatul Khusna, S.Si.; Muhammad Sjahid Akbar, S.Si, M.Si	
Language	Bahasa Indonesia and English	
Relation to curriculum	Undergraduate degree program, **mandatory**, 6th semester.	
Type of teaching, contact hours	Lectures, <50 students	
Workload	1. Lectures: 3 x 50 = 150 minutes per week. 2. Exercises and Assignments: 3 x 60 = 180 minutes (3 hours) per week. 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	Regression Analysis	
Learning outcomes and their corresponding PLOs	CLO.1 Describe the use of time series analysis concept included to identification, parameter estimation, diagnostic checking, and forecasting CLO.2 Describe each procedure in building a time series model of the real cases	PLO.1
	CLO.3 Able to apply the time series analysis to provide the appropriate forecast value of the real cases CLO.4 Able to use the software to calculate the statistics in building a time series model CLO.5 Able to adapt to the current situation	PLO.3
	CLO.6 Able to provide a suitable decision based on the forecast result of the time series model and present the result in oral or written CLO.7 Able to communicate effectively and collaborate with the teams in interdisciplinary and multidisciplinary CLO.8 Have responsibilities and professional ethics CLO.9 Able to motivate themself to think creatively and lifelong learning	PLO.4

Content	Time series analysis is a proficiency course that is a part of the statistical modeling courses. The objectives in learning time series analysis are the students can understand the statistical concept in univariate time series (particularly in Exponential Smoothing, Time Series Regression, Decomposition, ARIMA), bivariate time series (particularly in Intervention Analysis, Outlier Detection, Calendar Variation Model, and Transfer Function with Single Input), and able to apply the methods in a real dataset. Through this course, the students are expected to have learning experiences with critical thinking and provide the appropriate decision relating to the suitable time series model on particular cases and its solution. The learning strategies used in this course are discussion, exercise, and assignment.
Study and examination requirements and forms of examination	• In-class exercises • Assignment • Mid-term exam • Final exam
Media employed	LCD, whiteboard, websites (myITS Classroom), zoom.
Reading list	1. Bowerman, B.L, O'Connell, R.T. and Koehler, A.B. 2005. Forecasting, Time Series, and Regression: An Applied Approach, 4th edition. USA: Duxbury Press. 2. Box, G.E.P., Jenkins, G.M., and Reinsel, D., 1994. Time Series Analysis: Forecasting and Control. 2nd edition. San Fransisco: Holden Day. 3. Cryer, J.D. and Chan, K-S., 2008. Time Series Analysis: with Application in R. Boston: PWS-KENT Publishing Company. 4. Hanke, J.E. and Wichern, D.W., 2008. Business Forecasting. 9th edition. Prentice Hall. 5. Wei, W.W.S., 2006. Time Series Analysis: Univariate and Multivariate Methods. USA: Addison-Wesley Publishing Co.

	Program Studi	Sarjana, Departemen Statistika, FMKSD-ITS
	Mata Kuliah	Analisis Deret Waktu
	Kode Mata Kuliah	KS184617
	Semester/SKS	VI/3
	MK Prasyarat	Analisis Regresi
RP-S1	Dosen Pengampu	Dr. Hidayatul Khusna, S.Si.; Muhammad Sjahid Akbar, S.Si, M.Si

Bahan Kajian ***Study Materials***	Dasar Sains, Teori Statistika, Deskripsi dan Eksplorasi, Komputasi dan Data Processing, Pemodelan, Industri dan Bisnis, Pemerintahan dan Kependudukan, Ekonomi dan Manajemen, Kesehatan dan Lingkungan, dan Sosial Humaniora *Basic Science, Statistical Theory, Description and Exploration, Computing and Data Processing, Modeling, Industry and Business, Government and Population, Economics and Management, Health and Environment, and Social Humanities*
CPL yang dibebankan MK ***PLO***	CPL-1 Mampu menerapkan pengetahuan teori statistika, matematika, dan komputasi CPL-3 Mampu menganalisis data dengan metode statistika yang tepat dan mengintepretasikannya CPL-4 Mampu mengindentifikasi,memformulasi, dan menyelesaikan masalah statistika di berbagai bidang terapan *PLO-1 Able to apply knowledge of science, statistical theory, mathematics, and computing to problems in various applied fields* *PLO-3 Able to analyze data using appropriate statistical methods and interpret them* *PLO-4 Able to identify, formulate, and solve statistical problems in various applied fields*
CP-MK ***CLO***	CPMK.1 Menjelaskan penggunaan konsep-konsep Analisis Deret Waktu yang meliputi identifikasi, estimasi parameter, cek diagnosa, dan peramalan CPMK.2 Menjelaskan setiap tahapan pada prosedur pembentukan model pada Analisis Deret Waktu pada suatu permasalahan nyata CPMK.3 Mampu mengaplikasikan Analisis Deret Waktu untuk mendapatkan ramalan yang tepat pada suatu permasalahan nyata CPMK.4 Mampu memanfaatkan aplikasi dan software untuk perhitungan besaran-besaran statistik untuk pembentukan model Analisis Deret Waktu CPMK.5 Mampu beradaptasi terhadap situasi yang dihadapi CPMK.6 Mampu mengambil keputusan yang tepat berdasarkan hasil ramalan dari suatu model deret waktu dan mampu mengkomunikasikan hasil analisis baik secara lisan maupun tertulis CPMK.7 Mampu berkomunikasi secara efektif dan bekerjasama dalam tim yang interdisiplin dan multidisiplin CPMK.8 Memiliki tanggung jawab dan etika profesi CPMK.9 Mampu memotivasi diri untuk berpikir kreatif dan belajar sepanjang hayat *CLO.1 Describe the use of time series analysis concept included to identification, parameter estimation, diagnostic checking, and forecasting* *CLO.2 Describe each procedure in building a time series model of the real cases* *CLO.3 Able to apply the time series analysis to provide the appropriate forecast value of the real cases* *CLO.4 Able to use the software to calculate the statistics in building a time series model* *CLO.5 Able to adapt to the current situation* *CLO.6 Able to provide a suitable decision based on the forecast result of the time series model and present the result in oral or written* *CLO.7 Able to communicate effectively and collaborate with the teams in interdisciplinary and multidisciplinary* *CLO.8 Have responsibilities and professional ethics* *CLO.9 Able to motivate themself to think creatively and lifelong learning*

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RP-S1	Dosen Pengampu	Dr. Hidayatul Khusna, S.Si.; Muhammad Sjahid Akbar, S.Si, M.Si

Perte-muan *Meeting*	**Kemampuan Akhir Sub CP-MK** *Final Ability*	**Keluasan (materi pembelajaran)** *Extent (learning material)*	**Metode Pembelajaran** *Learning methods*	**Estimasi Waktu** *Duration*	**Bentuk Evaluasi** *Evaluation Type*	**Kriteria dan Indikator Penilaian** *Assessment Criteria and Indicators*	**Bobot Penilaian** *Scoring*
1-2	1. Dapat memahami konsep-konsep dalam Peramalan Kuantitatif, khususnya model *Exponential Smoothing*, *Time Series Regression*, Dekomposisi *Understand the concept of Quantitative Forecasting, particulary on Exponential Smoothing Model, Time Series Regression, and Decomposition*	Pengantar Peramalan Kuantitatif dengan pendekatan deret waktu. Model *Exponential Smoothing*, *Time Series Regression*, Dekomposisi. *Introduction of Quantitative Forecasting using Time Series approach.* *Exponential Smoothing Model, Time Series Regression, and Decomposition*	Ceramah Interaktif Diskusi (CID) *Interactive Lecture Discussion*	300 menit *300 minutes*	Observasi Aktifitas di kelas (TOA) *Observe the class activity*	1.1 Dapat menjelaskan konsep Peramalan Kuantitatif dengan pendekatan deret waktu. 1.2 Dapat menjelaskan konsep tentang Model *Exponential Smoothing*, *Time Series Regression*, Dekomposisi. *1.1 Able to describe the concept of Quantitative Forecasting using Time Series approach.* *1.2 Able to describe the concept of Exponential Smoothing Model, Time Series Regression, and Decomposition*	10% / 10% *10%/10%*
3	2. Dapat memahami konsep-konsep dalam Analisis Deret Waktu, khususnya pada data yang stasioner *Understand the concept of Time*	Konsep stasioneritas, ACF dan PACF. ACF dan PACF teoritis dari proses ARMA. *Stationary Concept, ACF and PACF* *Theoritical ACF and PACF for ARMA process*	Ceramah Interaktif Diskusi (CID) *Interactive Lecture Discussion*	150 menit *150 minutes*	Observasi Aktifitas di kelas (TOA) *Observe the class activity*	2.1 Dapat menjelaskan konsep stasioneritas, ACF, dan PACF. 2.2 Dapat menjelaskan konsep tentang ACF dan PACF teoritis dari proses ARMA. *2.1 Able to describe the Stationary Concept, ACF and PACF*	10% / 20% *10% / 20%*

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Perte-muan *Meeting*	**Kemampuan Akhir Sub CP-MK** *Final Ability*	**Keluasan (materi pembelajaran)** *Extent (learning material)*	**Metode Pembelajaran** *Learning methods*	**Estimasi Waktu** *Duration*	**Bentuk Evaluasi** *Evaluation Type*	**Kriteria dan Indikator Penilaian** *Assessment Criteria and Indicators*	**Bobot Penilaian** *Scoring*
	Series Analysis, particularly on the stationary data					*2.2 Able to describe the concept of theoritical ACF and PACF for ARMA process*	
4	2. Dapat memahami konsep-konsep dalam Analisis Deret Waktu, khususnya pada data yang non-stasioner *Understand the concept of Time Series Analysis, particularly on the non-stationary data*	Differencing, transformasi Box-Cox, dan Uji Dickey-Fuller. ACF dan PACF teoritis dari proses ARIMA. *Differencing, Box-Cox Transformation, and Dickey-Fuller test.* *Theoritical ACF and PACF for ARIMA process*	Ceramah Interaktif Diskusi (CID) *Interactive Lecture Discussion*	150 menit *150 minutes*	Observasi Aktifitas di kelas (TOA) Tugas 1 *Observe the class activity* *Assignment 1*	2.3 Dapat menjelaskan konsep Differencing, transformasi Box-Cox, dan Uji Dickey-Fuller. 2.4 Dapat menjelaskan konsep tentang tentang ACF dan PACF teoritis dari proses ARIMA. *2.3 Able to describe the concept of Differencing, Box-Cox Transformation, and Dickey-Fuller test* *2.4 Able to describe the concept of Theoritical ACF and PACF for ARIMA process*	10% / 30% *10% / 30%*
5-6	3. Dapat menerapkan konsep estimasi parameter, cek diagnosa, dan pemilihan model ARIMA terbaik *Able to estimate the parameter, do the diagnostic checking, and select the best ARIMA model*	Estimasi LS dan MLE. Cek diagnosa model ARIMA. Pemilihan model ARIMA terbaik. *Estimation using LS and MLE.* *Diagnostic Checking of ARIMA model.* *Selection of the best ARIMA model*	Ceramah Interaktif Diskusi (CID) *Interactive Lecture Discussion*	300 menit *300 minutes*	Tes 1 Observasi Aktifitas di kelas (TOA) *Test 1* *Observe the class activity*	3.1 Dapat membuktikan konsep Estimasi LS dan MLE. 3.2 Dapat menunjukkan konsep tentang Cek diagnosa model ARIMA. 3.3 Dapat menunjukkan konsep tentang Pemilihan model ARIMA terbaik. *3.1 Able to prove the concept of parameter estimation using LS and MLE.*	15% / 45% *15% / 45%*

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Perte-muan *Meeting*	**Kemampuan Akhir Sub CP-MK** *Final Ability*	**Keluasan (materi pembelajaran)** *Extent (learning material)*	**Metode Pembelajaran** *Learning methods*	**Estimasi Waktu** *Duration*	**Bentuk Evaluasi** *Evaluation Type*	**Kriteria dan Indikator Penilaian** *Assessment Criteria and Indicators*	**Bobot Penilaian** *Scoring*
						3.2 Able to explain the concept of diagnostic Checking of ARIMA model. *3.3 Able to explain the concept of model selection among ARIMA models*	
7	4. Dapat menerapkan konsep peramalan titik dan interval untuk k tahap kedepan *Able to apply the concept of point and interval forecast for k-step ahead*	Peramalan titik dan interval untuk k tahap kedepan *Point and Interval forecast for k-step ahead*	Ceramah Interaktif Diskusi (CID) *Interactive Lecture Discussion*	150 menit *150 minutes*	Observasi aktifitas di kelas (TOA) *Observe the class activity*	4.1 Dapat menunjukkan konsep Peramalan titik untuk k tahap kedepan. 4.2 Dapat menunjukkan konsep tentang Peramalan interval untuk k tahap kedepan. *4.1 Able to explain the concept of the Point forecast for k-step ahead* *4.2 Able to explain the concept of Interval forecast for k-step ahead*	10% / 55% *10% / 55%*
8	**ETS** ***MIDTERM EXAM***						
9	5. Dapat menerapkan konsep identifikasi, estimasi dan peramalan pada model Seasonal ARIMA *Able to apply the concept of*	Model Seasonal ARIMA: Identifikasi, estimasi dan peramalan *Seasonal ARIMA model : identification, estimation, and forecasting*	Ceramah Interaktif Diskusi (CID) *Interactive Lecture Discussion*	150 menit *150 minutes*	Observasi Aktifitas di kelas (TOA) *Observe the class activity*	5.1 Dapat menunjukkan konsep identifikasi, dan estimasi pada model Seasonal ARIMA. 5.2 Dapat menunjukkan konsep tentang peramalan pada model Seasonal ARIMA.	10% / 65% *10% / 65%*

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Perte-muan *Meeting*	**Kemampuan Akhir Sub CP-MK** *Final Ability*	**Keluasan (materi pembelajaran)** *Extent (learning material)*	**Metode Pembelajaran** *Learning methods*	**Estimasi Waktu** *Duration*	**Bentuk Evaluasi** *Evaluation Type*	**Kriteria dan Indikator Penilaian** *Assessment Criteria and Indicators*	**Bobot Penilaian** *Scoring*
	identification, estimation, and forecasting for Seasonal ARIMA model					*5.1 Able to explain the concept of identification and estimation for Seasonal ARIMA model* *5.2 Able to explain the concept of forecasting for Seasonal ARIMA model*	
10-11	6. Dapat memahami konsep pembentukan model intervensi dan deteksi outlier *Able to understand the concept of the intervention model and outlier detection.*	Model intervensi dan deteksi outlier: Identifikasi, estimasi, cek diagnosa dan peramalan *Intervention model and outlier detection: identification, estimation, diagnostic checking and forecasting*	Ceramah Interaktif Diskusi (CID) *Interactive Lecture Discussion*	300 menit *300 minutes*	Observasi Aktifitas di kelas (TOA) Tugas 2 *Observe the class activity* *Assignment 2*	6.1 Dapat menjelaskan konsep Identifikasi, estimasi, cek diagnosa dan peramalan pada model intervensi. 6.2 Dapat menjelaskan konsep tentang deteksi outlier. *6.1 Able to describe the concept of identification, estimation, and diagnostic checking for intervention model.* *6.2 Able to describe the concept of outlier detection*	15% / 80% *15% / 80%*
12-13	7. Dapat memahami konsep pembentukan model variasi kalender *Able to understand the concept of the Calendar Variation Model*	Model variasi kalender: Identifikasi, estimasi, cek diagnosa dan peramalan *Calendar Variation Model : identification, estimation, diagnostic checking and forecasting*	Ceramah Interaktif Diskusi (CID) *Interactive Lecture Discussion*	300 menit *300 minutes*	Tes 2 Observasi Aktifitas di kelas (TOA) *Test 2* *Observe the class activity*	7.1 Dapat menjelaskan konsep identifikasi, dan estimasi pada model variasi kalender. 7.2 Dapat menjelaskan konsep tentang peramalan pada model variasi kalender. *7.1 Able to describe the concept of identification and estimation for Calendar Variation Model*	10% / 90% *10% / 90%*

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Perte-muan *Meeting*	**Kemampuan Akhir Sub CP-MK** *Final Ability*	**Keluasan (materi pembelajaran)** *Extent (learning material)*	**Metode Pembelajaran** *Learning methods*	**Estimasi Waktu** *Duration*	**Bentuk Evaluasi** *Evaluation Type*	**Kriteria dan Indikator Penilaian** *Assessment Criteria and Indicators*	**Bobot Penilaian** *Scoring*
						7.2 Able to describe the concept of forecasting for Calendar Variation Model	
14-15	8. Dapat memahami konsep pembentukan model fungsi transfer *Able to understand the concept of the Transfer Function Model*	Model fungsi transfer single input: Identifikasi, estimasi, cek diagnosa dan peramalan *Transfer Function Model : identification, estimation, diagnostic checking and forecasting*	Ceramah Interaktif Diskusi (CID) *Interactive Lecture Discussion*	300 menit *300 minutes*	Observasi Aktifitas di kelas (TOA) *Observe the class activity*	8.1 Dapat menjelaskan konsep identifikasi, dan estimasi pada model fungsi transfer. 8.2 Dapat menjelaskan konsep tentang peramalan pada model fungsi transfer. *8.1 Able to describe the concept of identification and estimation for Transfer Function Model* *8.2 Able to describe the concept of forecasting for Transfer Function Model*	10% / 100% *10% / 100%*
16	**EAS** ***FINAL EXAM***						

PUSTAKA/*REFERENCES*:

1. Wei, W.W.S., 2006, *Time Series Analysis: Univariate and Multivariate Methods*, Addison-Wesley Publishing Co., USA.
2. Cryer, J.D. and Chan, K-S., 2008, *Time Series Analysis: with Application in R*, Boston: PWS-KENT Publishing Company.
3. Bowerman, B.L, O'Connell, R.T. and Koehler, A.B. 2005. *Forecasting, Time Series, and Regression: An Applied Approach*, 4th Edition, Duxbury Press: USA.
4. Hanke, J.E. and Wichern, D.W., 2008, *Business Forecasting*, 9th edition, Prentice Hall.
5. Box, G.E.P., Jenkins, G.M., and Reinsel, D., 1994, *Time Series Analysis: Forecasting and Control*, 2nd Edition, Holden Day: San Fransisco.

	RENCANA ASSESSMENT & EVALUASI *Assesment and Evaluation Plan* Prodi Sarjana Statistika/ *Statistics Bachelor* **ANALISIS DERET WAKTU/** *TIME SERIES ANALYSIS*		**RA&E** SLK-15
Kode: KS184617 *Code: KS184617*	**Bobot sks** (T/P): 3 *CREDITS : 3*	**Rumpun MK**: Statistika Teori dan Pemodelan *Course group:* *Statistical theory and modelling*	Smt: VI *Semester VI*
OTORISASI *AUTHORIZATION*	**Penyusun** *Author* Dr. Hidayatul Khusna, S.Si.	**Koordinator RMK** *Coordinator* Dr. Santi Wulan Purnami, M.Si	**Kaprodi** *Head of Department* Dr. Kartika Fithriasari, M.Si

Mg ke (1)	Sub CP-MK (2)		Bentuk Asesmen (Penilaian) (3)	Bobot (%) (4)
	No	Kemampuan akhir		
1-2	1	Dapat memahami konsep-konsep dalam Peramalan Kuantitatif, khususnya model Exponential Smoothing, Time Series Regression, Dekomposisi *Understand the concept of Quantitative Forecasting, particulary on Exponential Smoothing Model, Time Series Regression, and Decomposition*	Tugas 1 *Assignment 1*	2.5
3	2.1	Dapat memahami konsep-konsep dalam Analisis Deret Waktu, khususnya pada data yang stasioner *Understand the concept of Time Series Analysis, particularly on the stationary data*	Tugas 1 *Assignment 1*	5
4	2.2	Dapat memahami konsep-konsep dalam Analisis Deret Waktu, khususnya pada data yang non-stasioner *Understand the concept of Time Series Analysis, particularly on the non-stationary data*	Tugas 1 *Assignment 1* Kuis 1 *Quiz 1*	2.5 2.5
5-6	3	Dapat menerapkan konsep estimasi parameter, cek diagnosa, dan pemilihan model ARIMA terbaik *Able to estimate the parameter, do the diagnostic checking, and select the best ARIMA model*	Kuis 1 *Quiz 1*	5
7	4	Dapat menerapkan konsep peramalan titik dan interval untuk k tahap kedepan *Able to apply the concept of point and interval forecast for k-step ahead*	Kuis 1 *Quiz 1*	2.5
8	2-4		Evaluasi Tengah Semester *Midterm Exam*	30
9	5	Dapat menerapkan konsep identifikasi, estimasi dan peramalan pada model Seasonal ARIMA *Able to apply the concept of identification, estimation, and forecasting for Seasonal ARIMA model*	Tugas 2 *Assignment 2*	5

Mg ke (1)	Sub CP-MK (2)		Bentuk Asesmen (Penilaian) (3)	Bobot (%) (4)
	No	Kemampuan akhir		
10-11	6	Dapat memahami konsep pembentukan model intervensi dan deteksi outlier *Able to understand the concept of the intervention model and outlier detection.*	Tugas 2 *Assignment 2*	5
12-13	7	Dapat memahami konsep pembentukan model variasi kalender *Able to understand the concept of the Calendar Variation Model*	Kuis 2 *Quiz 2*	5
14-15	8	Dapat memahami konsep pembentukan model fungsi transfer *Able to understand the concept of the Transfer Function Model*	Kuis 2 *Quiz 2*	5
16	6-8		Evaluasi Akhir *Final Exam*	30
			Total bobot penilaian	**100%**

Portofolio penilaian & evaluasi proses dan hasil belajar setiap mahasiswa

Assessment & evaluation of the process and learning outcomes of each student

CPL/PLO	Sub CPMK/Sub CLO	Minggu ke/Week	Bentuk Asesmen/Type of Assesment	Bobot (%)/Weight (%)
CPL-01/*PLO-1*	Sub CPMK 1,2	Mg ke 4	Assignment 1	2.5
	Sub CPMK 2,3,4	Mg ke 6	Quiz 1	3.5
	Sub CPMK 2,3,4	Mg ke 8	Midterm Exam	10
	Sub CPMK 5,6	Mg ke 11	Assignment 2	2.5
	Sub CPMK 7,8	Mg ke 13	Quiz 2	3.5
	Sub CPMK 6,7,8	Mg ke 16	Final Exam	8
CPL-03/*PLO-3*	Sub CPMK 2,3,4	Mg ke 6	Quiz 1	4
	Sub CPMK 2,3,4	Mg ke 8	Midterm Exam	10
	Sub CPMK 5,6	Mg ke 11	Assignment 2	7
	Sub CPMK 7,8	Mg ke 13	Quiz 2	4
	Sub CPMK 6,7,8	Mg ke 16	Final Exam	15
CPL-04/*PLO-4*	Sub CPMK 2,3,4	Mg ke 6	Quiz 1	2.5
	Sub CPMK 2,3,4	Mg ke 8	Midterm Exam	10
	Sub CPMK 5,6	Mg ke 11	Assignment 2	8
	Sub CPMK 7,8	Mg ke 13	Quiz 2	2.5
	Sub CPMK 6,7,8	Mg ke 16	Final Exam	7
				∑ = 100%

No	Assessment	PLO-01	PLO-02	PLO-03	PLO-04	PLO-05	PLO-06	PLO-07	PLO-08	PLO-09	TOTAL
1	Quiz	0.07		0.08	0.05						**0.2**
2	Midterm exam	0.1		0.1	0.1						**0.3**
3	Assignment	0.05		0.07	0.08						**0.2**
4	Final exam	0.08		0.15	0.07						**0.3**
	TOTAL	0.3	0	0.4	0.3	0	0	0	0	0	1