

MODULE HANDBOOK

TIME SERIES ECONOMETRICS



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

ENDORSEMENT PAGE



MODULE HANDBOOK TIME SERIES ECONOMETRICS 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>	Dr. Muhammad Sjahid Akbar, S.Si, M.Si	Dosen Lecturer		
Pemeriksa dan Pengendalian <i>Review and Control</i>	Dr. Ir. Setiawan, M.S. ; Dr. Drs. Agus Suharsono, M.S. ; Dr. Muhammad Sjahid Akbar, S.Si, M.Si ; Prof. Dr. rer.pol. Heri Kuswanto, M.Si ; Dr. rer. pol. Dedy Dwi Prastyo, M.Si	Tim kurikulum Curriculum team		
Persetujuan <i>Approval</i>	Dr. Ir. Setiawan, MS	Koordinator RMK Course Cluster Coordinator		
Penetapan <i>Determination</i>	Dr. Kartika Fithriasari, M.Si	Kepala Departemen Head of Department		

MODULE HANDBOOK

TIME SERIES ECONOMETRICS

Module name	TIME SERIES ECONOMETRICS	
Module level	Undergraduate	
Code	SS234749	
Course (if applicable)	TIME SERIES ECONOMETRICS	
Semester	7	
Person responsible for the module	Dr. Muhammad Sjahid Akbar, S.Si, M.Si	
Lecturer	Dr. Ir. Setiawan, M.S. Dr. Drs. Agus Suharsono, M.S. Dr. Muhammad Sjahid Akbar, S.Si, M.Si Prof. Dr. rer.pol. Heri Kuswanto, M.Si Dr. rer. pol. Dedy Dwi Prastyo, M.Si	
Language	Bahasa Indonesia and English	
Relation to curriculum	Undergraduate degree program, mandatory, 7th semester.	
Type of teaching, contact hours	Lectures, <50 students	
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	Regression Analysis, Introduction to Econometrics, Introduction to Time Series Analysis	
Learning outcomes and their corresponding PLOs	<p>CLO.1 Understand economic terms and provide an understanding of the basic understanding and concepts of economics</p> <p>CLO.2 Able to explain economic theory (micro and macro) verbally, graphically, and mathematically</p> <p>CLO.3 Able to apply economics to analyze data in their field of work with appropriate statistical methods</p> <p>CLO.4 Able to identify and formulate problems in their field of work into an economic model to solve problems</p>	<p>PLO-9</p> <p>PLO-10</p>

	<p>CLO.6 Have knowledge of current and future issues related to the economic sector (micro and macro)</p> <p>CLO.7 Able to communicate effectively and work together in interdisciplinary and multidisciplinary teams</p> <p>CLO.8 Having professional responsibility and ethics</p> <p>CLO.9 Able to motivate yourself to think creatively and learn throughout life</p>	
Content	<p>Econometrics is a course in the field of economic and financial statistics. The purpose of this course is to be able to apply statistical methods in the field of economics. In this course, students will learn about econometric methodology in research which includes making model specifications, estimating models, evaluating the results of model estimates, and evaluating forecasting power. The econometric models discussed include single equations, SUR, as well as both static and dynamic simultaneous equations with applications in micro and macro economics. In this lecture, case studies will also be presented to evaluate the results of other people's research, as well as econometric modeling so that they can be used as tools in decision making to solve problems in real cases</p>	
Assessment and its weight	<p>Study Case(25%) Project(30%) Cognitive - Midterm Exam(20%) Cognitive - Final Exam(25%)</p>	
Media employed	<p>LCD, whiteboard, websites (myITS Classroom), zoom</p>	
Reading list	<ol style="list-style-type: none"> 1. Lutkepohl, H and Kratzig M. 2004. Applied Time Series Econometrics. First edition. Cambridge University Press. 2. Setiawan dan Kusri DE,. Ekonometrika. 2008 3. Gujarati. 2008. <i>Basic Econometrics</i>. 4th edition. McGraw-Hill Companies. 4. Greene, William H.: Econometric Analysis, 4th ed., Prentice Hall, Englewood Cliffs, N. J., 2000. 5. Neusser K. 2016. Time Series Econometrics. Springer International Publishing Switzerland. 	



INSTITUT TEKNOLOGI SEPULUH NOPEMBER
FAKULTAS SAINS DAN ANALITIKA DATA
PROGRAM STUDI SARJANA STATISTIKA
DEPARTEMEN STATISTIKA

RENCANA PEMBELAJARAN SEMESTER/
SEMESTER LEARNING PLAN

MATA KULIAH (MK)/ <i>Course</i>	KODE/ <i>Code</i>	Rumpun MK/ <i>Course Group</i>	BOBOT (sks)/ <i>Weight (credit)</i>		SEMESTER/ <i>Semester</i>	Tgl Penyusunan/ <i>Drafting Date</i>
Ekonometrika Deret Waktu/ <i>TIME SERIES ECONOMETRICS</i>	SS234749	ANDEF	T=3	P=0	VII	11 Januari 2023
OTORISASI/ <i>AUTHORIZATION</i>	Pengembang RPS/ <i>RPS Developer</i>	Koordinator RMK/ <i>Course Group Coordinator</i>		Ketua PRODI/ <i>Head of Department</i>		
	Dr. Ir. Setiawan, MS, Dr. Muhammad Sjahid Akbar Santi Puteri R, M.Si, Ph.D, Prof. Dr. rer.pol. Heri Kuswanto, M.Si Dr.rer.pol. Dedy Dwi P, M.Si	Dr. Ir. Setiawan, MS		Dr. Kartika Fithriasari, M.Si		
Capaian Pembelajaran (CP)/ <i>Learning Achievement</i>	CPL-PRODI yang dibebankan pada MK/ <i>PLO</i>					
	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 <i>Able to apply statistical methods to analyze problems theoretically and completely</i>				
	<i>PLO-9</i> <i>PLO-10</i>	<i>Able to apply business, industrial, economic, social, health or environmental statistical methods to real problems</i>				
	Capaian Pembelajaran Mata Kuliah (CPMK)/ <i>CLO</i>					
	CPMK.1	Mampu memahami definisi, ruang lingkup, dan tahapan penelitian ekonometrika.				
	CPMK.2	Memformulasikan fenomena/masalah ekonomi mikro dan makro dalam model ekonometrika dan memilih metode estimasi				

	<p>(statistik) yang sesuai</p> <p>CPMK.3 Mampu mengaplikasikan metodologi ekonometrika di bidang kerjanya</p> <p>CPMK.4 Mampu memformulasikan persoalan di bidang kerjanya ke dalam model ekonometrika dengan persamaan tunggal maupun sistem persamaan (SUR dan simultan) untuk menyelesaikan masalah</p> <p>CPMK.6 Memiliki pengetahuan tentang isu terkini dan mendatang yang berkaitan dengan bidang ekonometrika supaya mampu mengambil keputusan yang tepat berdasarkan analisis model ekonometrika (mikro dan makro) , serta mampu mengkomunikasikan hasil analisis baik secara lisan maupun tertulis</p> <p>CPMK.7 Mampu berkomunikasi secara efektif dan bekerjasama dalam tim yang interdisiplin dan multidisiplin</p> <p>CPMK.8 Memiliki tanggung jawab dan etika profesi</p> <p>CPMK.9 Mampu memotivasi diri untuk berpikir kreatif dan belajar sepanjang hayat</p> <p><i>CLO.1 Understand economic terms and provide an understanding of the basic understanding and concepts of economics</i></p> <p><i>CLO.2 Able to explain economic theory (micro and macro) verbally, graphically, and mathematically</i></p> <p><i>CLO.3 Able to apply economics to analyze data in their field of work with appropriate statistical methods</i></p> <p><i>CLO.4 Able to identify and formulate problems in their field of work into an economic model to solve problems</i></p> <p><i>CLO.6 Have knowledge of current and future issues related to the economic sector (micro and macro)</i></p> <p><i>CLO.7 Able to communicate effectively and work together in interdisciplinary and multidisciplinary teams</i></p> <p><i>CLO.8 Having professional responsibility and ethics</i></p> <p><i>CLO.9 Able to motivate yourself to think creatively and learn throughout life</i></p>																																																																																																														
	<p>Matrik CPL – CPMK <i>PLO-CLO Matrix</i></p> <table border="1" data-bbox="546 986 2009 1329"> <thead> <tr> <th>CPMK</th> <th>CPL-01</th> <th>CPL-02</th> <th>CPL-03</th> <th>CPL-04</th> <th>CPL-05</th> <th>CPL-06</th> <th>CPL-07</th> <th>CPL-08</th> <th>CPL-09</th> <th>CPL-10</th> </tr> </thead> <tbody> <tr> <td>CPMK-1</td> <td></td> <td>V</td> <td>V</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>CPMK-2</td> <td>V</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>CPMK-3</td> <td>V</td> <td>V</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>CPMK-4</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>CPMK-5</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>CPMK-6</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>CPMK-7</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>CPMK-8</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>CPMK-9</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	CPMK	CPL-01	CPL-02	CPL-03	CPL-04	CPL-05	CPL-06	CPL-07	CPL-08	CPL-09	CPL-10	CPMK-1		V	V								CPMK-2	V										CPMK-3	V	V									CPMK-4											CPMK-5											CPMK-6											CPMK-7											CPMK-8											CPMK-9										
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Deskripsi Singkat MK/ Course Description	<p>Ekonometrika deret waktu merupakan salah satu matakuliah di bidang statistika ekonomi dan finansial. Tujuan dari matakuliah ini adalah agar mahasiswa mampu menerapkan metode statistika di bidang ekonomi. Pada matakuliah ini, mahasiswa akan belajar tentang metodologi ekonometrika deret waktu dalam penelitian yang meliputi membuat spesifikasi model, estimasi model, melakukan evaluasi hasil estimasi model, serta evaluasi daya peramalan. Model ekonometrika deret waktu yang dibahas meliputi <i>seemingly unrelated regression</i> (SUR), sistem persamaan simultan baik yang statis maupun yang dinamis, ARIMAX, <i>Vector autoregressive</i> (VAR), <i>Generalized Space Time Autoregressive</i> (GSTAR) dengan aplikasi pada ekonomi mikro dan makro. Pada kuliah ini, akan disampaikan juga studi kasus untuk mengevaluasi hasil penelitian orang lain, serta pemodelan <i>timeseries</i> ekonometrika agar dapat digunakan sebagai alat dalam pengambilan keputusan untuk menyelesaikan masalah pada kasus real.</p> <p><i>Econometrics is a course in the field of economic and financial statistics. The purpose of this course is to be able to apply statistical methods in the field of economics. In this course, students will learn about econometric methodology in research which includes making model specifications, estimating models, evaluating the results of model estimates, and evaluating forecasting power. The econometric models discussed include single equations, SUR, as well as both static and dynamic simultaneous equations with applications in micro and macro economics. In this lecture, case studies will also be presented to evaluate the results of other people's research, as well as econometric modeling so that they can be used as tools in decision making to solve problems in real cases</i></p>
Bahan Kajian: Materi Pembelajaran/ Course Material	<p>Dasar Sains, Teori Statistika, Pengumpulan Data, Deskripsi dan Eksplorasi, Komputasi dan Data Processing, Pemodelan, Industri dan Bisnis, Ekonomi dan Manajemen</p> <p><i>Statistics Theory, Collecting Data, Description and Exploration, Computation and Data Processing, Modeling, Industrial and Business, Economic and Management</i></p>
Pustaka/ References	<p>Utama/Primary:</p> <ol style="list-style-type: none"> 1. Lutkepohl, H and Kratzig M. 2004. Applied Time Series Econometrics. First edition. Cambridge University Press. <p>Pendukung/Secondary :</p> <ol style="list-style-type: none"> 2. Setiawan dan Kusri DE,. Ekonometrika. 2008 3. Gujarati. 2008. <i>Basic Econometrics</i>. 4th edition. McGraw-Hill Companies. 4. Greene, William H.: <i>Econometric Analysis</i>, 4th ed., Prentice Hall, Englewood Cliffs, N. J., 2000. 5. Neusser K. 2016. <i>Time Series Econometrics</i>. Springer International Publishing Switzerland.
Dosen Pengampu/ Lecturers	<p>Dr. Ir. Setiawan ; Dr. Muhammad Sjahid Akbar, S.Si. M.Si ; Dr.rer.pol. Dedy Dwi P, M.Si ; Prof. Dr. rer.pol. Heri Kuswanto, M.Si</p>
Matakuliah syarat/	<p>Analisis Regresi, Pengantar Ekonometrika, Pengantar Analisis Deret Waktu</p>

<i>Pre-requisite Course</i>		<i>Regression Analysis, Introduction to Econometrics, Introduction to Time Series Analysis</i>					
<i>Mg Ke-Week</i>	<i>Kemampuan akhir tiap tahapan belajar (Sub-CPMK) Final capability for each learning step</i>	<i>Penilaian Evaluation</i>		<i>Bantuk Pembelajaran, Metode Pembelajaran, Penugasan Mahasiswa, [Estimasi Waktu]</i>		<i>Materi Pembelajaran [Pustaka] Learning Material [References]</i>	<i>Bobot Penilaian (%) Evaluation Weight (%)</i>
		<i>Indikator Indicator</i>	<i>Kriteria & Bentuk Criteria and Format</i>	<i>Luring Offline</i>	<i>Daring Online</i>		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	Mampu memahami definisi dan ruang lingkup ekonometrika deret waktu <i>Able to understand the definition and scope of time series econometrics</i>	Dapat menjelaskan pengertian model dan model ekonometrika deret waktu Dapat menjelaskan definisi Ekonometrika deret waktu Dapat menjelaskan ruang lingkup ekonometrika deret waktu <i>Can explain the meaning of econometric models and time series models</i> <i>Can explain the definition of time series econometrics</i> <i>Can explain the scope of time series econometrics</i>	Ceramah dan Diskusi, <i>Lectures and Discussions,</i>	TM: 3x50" LT: 3x60" BM: 3x60" <i>L: 3x50"</i> <i>EA: 3x60"</i> <i>IL: 3x60"</i>		Lutkepohl, H and Kratzig M. 2004. Applied Time Series Econometrics. First edition. Cambridge University Press.	7%/7%

2-3	<p>Mampu memodelkan fenomena ekonomi dengan menggunakan pendekatan sistem persamaan SUR</p> <p><i>Able to model economic phenomena using the SUR equation system approach</i></p>	<p>Dapat menjelaskan cara membuat spesifikasi model SUR</p> <p>Dapat menjelaskan cara melakukan estimasi parameter model SUR.</p> <p>Dapat menjelaskan cara melakukan evaluasi terhadap model SUR yang dihasilkan</p> <p><i>Can explain how to make SUR model specifications</i></p> <p><i>Can explain how to estimate the parameters of the SUR model.</i></p> <p><i>Can explain how to evaluate the resulting SUR model</i></p>	<p>Ceramah Diskusi, latihan soal</p> <p><i>Lectures, Discussions, Exercise</i></p>	<p>TM: 2x3x50" LT: 2x3x60" BM: 2x3x60"</p> <p><i>L: 2x3x50"</i> <i>EA: 2x3x60"</i> <i>IL: 2x3x60"</i></p>		<p>Zellner, . "An Efficient Method of Estimating Seemingly Unrelated Regressions and Tests for Aggregation Bias". <i>Journal of the American Statistical Association</i>, vol. 57, 1962, pp. 348–368.</p>	13%/20%
4-6	<p>Mampu memodelkan fenomena ekonomi dengan menggunakan pendekatan sistem persamaan Simultan</p> <p><i>Able to model economic phenomena using the Simultaneous system of equations approach</i></p>	<p>Dapat menjelaskan cara membuat spesifikasi sistem persamaan simultan</p> <p>Dapat menjelaskan cara melakukan estimasi parameter sistem persamaan simultan.</p> <p>Dapat menjelaskan cara melakukan evaluasi terhadap sistem persamaan simultan yang dihasilkan</p> <p><i>Can explain how to make a specification system of simultaneous equations Can explain how to estimate the</i></p>	<p>Ceramah Diskusi dan latihan soal, Tugas</p> <p><i>Lectures, Discussions, Exercise , and practice</i></p>	<p>TM: 3x50" LT: 3x60" BM: 3x60"</p> <p><i>L: 3x3x50"</i> <i>EA:3x3x60"</i> <i>IL: 3x3x60"</i></p>		<p>Gujarati,. "Basic Econometrics". Fourth Edition. McGraw-Hill Companies. 2004</p>	8%/28%

		<i>parameters of a system of simultaneous equations. Can explain how to evaluate the resulting system of simultaneous equations</i>					
7	Studi Kasus <i>Case study</i>	Menerapkan metode-metode tersebut pada studi kasus riil <i>Applying these methods to real case studies</i>	Studi kasus Diskusi tugas presentasi makalah <i>Case study Task discussion presentation paper</i>	TM: 3x50" LT: 3x60" BM: 3x60" <i>L: 3x50" EA: 3x60" IL: 3x60"</i>			7%/35%
8	ETS/Midterm						
9-10	Dapat memahami konsep pembentukan model ARIMAX <i>Can understand the concept of forming the ARIMAX model</i>	Dapat menunjukkan konsep identifikasi pada model ARIMAX. Dapat menunjukkan konsep estimasi, cek diagnosa pada model ARIMAX. Dapat menghitung peramalan pada model ARIMAX. <i>Can demonstrate the concept of identification in the ARIMAX model.</i> <i>Can demonstrate the concept of estimation, check diagnostics on ARIMAX models.</i> <i>Can calculate forecasting on the ARIMAX model.</i>	Ceramah Diskusi, latihan soal <i>Lectures, Discussions, Exercise</i>	TM: 2x3x50" LT: 2x3x60" BM: 2x3x60" <i>L: 2x3x50" EA: 2x3x60" IL: 2x3x60"</i>		Gujarati,. "Basic Econometrics". Fourth Edition. McGraw-Hill Companies. 2004	8%/58%
11-12	Dapat memahami konsep pembentukan	Dapat menunjukkan konsep identifikasi pada model VAR.	Ceramah Diskusi, latihan soal, tes	TM: 2x3x50" LT: 2x3x60"		Gujarati,. "Basic Econometrics". Fourth	15%/73%

	<p>model VAR</p> <p><i>Can understand the concept of forming a VAR model</i></p>	<p>Dapat menunjukkan konsep estimasi, cek diagnosa pada model VAR.</p> <p>Dapat menghitung peramalan pada model VAR.</p> <p><i>Can demonstrate the concept of identification on the VAR model.</i></p> <p><i>Can demonstrate the concept of estimation, check the diagnosis on the VAR model.</i></p> <p><i>Can calculate forecasting on the VAR model.</i></p>	<p><i>Lectures, Discussions, Exercise, test</i></p>	<p>BM: 2x3x60"</p> <p>L: 2x3x50"</p> <p>EA: 2x3x60"</p> <p>IL: 2x3x60"</p>		<p>Edition. McGraw-Hill Companies. 2004</p>	
13-14	<p>Dapat memahami konsep pembentukan model GSTAR</p> <p><i>Can understand the concept of forming the GSTAR model</i></p>	<p>Dapat menunjukkan konsep identifikasi pada model GSTAR.</p> <p>Dapat menunjukkan konsep estimasi, cek diagnosa pada model GSTAR.</p> <p>Dapat menghitung peramalan pada model GSTAR.</p> <p><i>Can demonstrate the concept of identification on the GSTAR model.</i></p> <p><i>Can demonstrate the concept of estimation, check diagnostics on GSTAR models.</i></p>	<p>Ceramah Diskusi, latihan soal,</p> <p><i>Lectures, Discussions, Exercise</i></p>	<p>TM: 2x3x50"</p> <p>LT: 2x3x60"</p> <p>BM: 2x3x60"</p> <p>L: 2x3x50"</p> <p>EA: 23x3x60"</p> <p>IL: 2x3x60"</p>		<p>Gujarati,. "Basic Econometrics". Fourth Edition. McGraw-Hill Companies. 2004</p>	20%/93%

		<i>Can calculate forecasting on the GSTAR model.</i>					
15	Studi Kasus <i>Case study</i>	Menerapkan salah satu metode ARIMAX, VAR dan GSTAR pada studi kasus riil <i>Applying one of the ARIMAX, VAR and GSTAR methods to a real case study</i>	Studi kasus Diskusi tugas presentasi makalah <i>Case study Task discussion presentation paper</i>	TM: 3x50" LT: 3x60" BM: 3x60" L: 3x50" EA: 3x60" IL: 3x60"			7%/100%
16	Evaluasi Akhir Semester / Ujian Akhir Semester/ <i>final exam</i>						

