

# X81 TIME SERIES ANALYSIS

## COURSE OUTLINE

### 1. GENERAL

<b>SCHOOL</b>	ECONOMIC SCIENCES		
<b>DEPARTMENT</b>	ECONOMICS & SUSTAINABLE DEVELOPMENT		
<b>LEVEL OF STUDY</b>	<i>Undergraduate</i>		
<b>COURSE UNIT CODE</b>	X81	<b>SEMESTER OF STUDY</b>	8 <sup>th</sup>
<b>COURSE TITLE</b>	TIME SERIES ANALYSIS		
<b>COURSEWORK BREAKDOWN</b>		<b>TEACHING WEEKLY HOURS</b>	<b>ECTS Credits</b>
	Lectures	2	
	Laboratory	1	
		3	7.5
<b>COURSE UNIT TYPE</b>	SCIENTIFIC AREA		
<b>PREREQUISITES :</b>	n/a		
<b>LANGUAGE OF INSTRUCTION/EXAMS:</b>	English		
<b>COURSE DELIVERED TO ERASMUS STUDENTS</b>	YES		
<b>MODULE WEB PAGE (URL)</b>			

### 2. LEARNING OUTCOMES

<b>Learning Outcomes</b>
On successful <i>completion of this module</i> students will be able to: <ul style="list-style-type: none"><li>• Define and explain concepts such as stationarity and non-stationarity</li><li>• Developing forecasting models for time series with the use of an econometric software package (e.g. E-views).</li><li>• Critically evaluate and assess time series models and their results</li><li>• Critically evaluate and assess the results of diagnostic tests.</li><li>• Use models to make forecasts on time series.</li></ul>
<b>General Skills</b>
On successful <i>completion of this module</i> students will gain the following general skills: <ul style="list-style-type: none"><li>• Critical assessment</li><li>• Decision making</li><li>• Data and information analysis with the use of technology</li></ul>

### 3. COURSE CONTENTS

<p>The module focuses on the analysis of time series which is one of the important types of data that are being used in the empirical analysis. The module aims to familiarize students with the necessary statistical concepts and the use of appropriate econometric techniques for the development of time series forecasting models with the use of an econometric software package (e.g. E-views).</p> <p>Suggested Module Content:</p> <ul style="list-style-type: none"><li>• Introduction to time series</li></ul>
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- Stochastic processes and basic concepts
- Autoregressive (AR) models
- Moving Average (MA) models
- Autoregressive and Moving Average (ARMA) models
- Autoregressive Integrated Moving Average (ARIMA) models
- Diagnostic tests and model selection criteria
- Forecasting
- Volatility models (ARCH-GARCH)

#### 4. TEACHING METHODS - ASSESSMENT

<b>MODE OF DELIVERY</b>	Class contact	
<b>USE OF INFORMATION AND COMMUNICATION TECHNOLOGY</b>	<ul style="list-style-type: none"> <li>• Dynamic PowerPoint presentations</li> <li>• e-class support</li> <li>• Communication via e-mail and course discussion group</li> <li>• Use of Econometric software (e.g. E-views)</li> </ul>	
<b>TEACHING METHODS</b>	<b><i>Method description</i></b>	<b><i>Semester Workload</i></b>
	lectures	26
	Laboratory	13
	Self-directed learning	139.5
	<b><i>Course total (25 hours of work load per credit)</i></b>	<b><i>187.5</i></b>
<b>ASSESSMENT METHODS</b>	<p>5. Final examination (<b>weighting 50%</b>) that contains:</p> <p>5.1. Theory evaluation</p> <p>5.2. Problems</p> <p>6. Individual Assignment involving the use of econometric software (<b>weighting 50%</b>).</p> <p><u>Notes:</u></p> <p>The assessment procedure and the assessment criteria will be available on the module's e-class web-page.</p>	

#### 5. RESOURCES

-- Recommended Book Resources:

6. Asteriou, D. and Hall, S.G. (2011). Applied econometrics. New York, NY: Palgrave Macmillan.
7. Greene, W. H. (2012). Econometric Analysis, 7th Edition, Prentice Hall, Upper Saddle River, N.J.
8. Hamilton, J.D. (1994). Time series analysis, Princeton University Press
9. Harvey, A. C. (1993). Time series models, 2nd edition, Cambridge: Harvester Wheatsheaf.
10. Hatanaka, M. (1998). Time-series-based econometrics: Unit roots and co-integrations, Oxford University Press.
11. Harris, H. and R. Sollis. (2003). Applied time series modelling and forecasting, John Wiley, New York, 2003.
12. Wooldridge, J.M. (2012). Introductory econometrics: A modern approach, Michigan State University, 2012.

- Indicative Reading list - Journals:

- Econometrics
- Journal of Econometrics
- Econometric Reviews
- Journal of Time Series Analysis
- Journal of Time Series Econometrics
- Quantitative Finance
- Journal of Empirical Finance
- Econometrics Journal
- Journal of Applied Econometrics
- Advances in Econometrics
- Journal of Time Series Econometrics
- Econometrics (MDPI)
- Foundations and Trends in Econometrics
- International Journal of Computational Economics and Econometrics
- Applied Financial Economics