

## Incoming student mobility

UNIOS University Unit: DEPARTMENT OF MATHEMATICS

COURSES OFFERED IN FOREIGN LANGUAGE  
FOR ERASMUS+ INDIVIDUAL INCOMING STUDENTS

Department or Chair within the UNIOS Unit	Department of Mathematics
Study program	Graduate university study programme in mathematics (Master level) Branches: <ul style="list-style-type: none"> <li>Financial Mathematics and Statistics-obligatory</li> </ul>
Study level	Graduate (master)
Course title	Time series analysis
Course code (if any)	M003
Language of instruction	English
Brief course description	<p>Syllabus.</p> <ol style="list-style-type: none"> <li>1. Introduction. Stationary processes. Examples. <math>L^2</math> space.</li> <li>2. Linear processes. MA processes. AR processes. ARMA processes. Nonstationarity and transformations (deterministic trend, differencing and ARIMA processes, power and log transformations).</li> <li>3. Fitting of ARMA models. Constant mean estimation. Model identification. Parameter estimation (least squares method, maximum likelihood method). Diagnostics. Prediction and <math>L^2</math> space. Prediction of ARIMA processes.</li> <li>4. Seasonal models. Seasonal ARMA processes. Seasonal ARIMA processes. Fitting SARIMA models and prediction. Spectral analysis.</li> <li>5. Multivariate time series. Conditional heteroskedasticity models (ARCH, GARCH). Other special models (models with long-range dependence, regression models with time series, insurance risk models).</li> </ol>
Form of teaching	Consultative teaching.
Form of assessment	Lectures and seminars are obligatory. During the course, statistical software will be used (e.g. R). The exam consists of a written and an

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	oral part and successfully defended seminar work. Upon completion of the course, students can take the exam. Successful midterm exam scores replace the written exam. The seminar consists of written report and oral presentation and is obligatory. Student may write homework during the course to improve their final grade.
Number of ECTS	6
Class hours per week	2+0+2
Minimum number of students	
Period of realization	Summer semester
Lecturer	Danijel Grahovac