

<b>Study programme(s):</b> Applied Mathematics – Data Science				
<b>Level:</b> master				
<b>Course title:</b> Time series				
<b>Lecturer:</b> Nataša M. Krklec Jerinkić				
<b>Status:</b> elective				
<b>ECTS:</b> 6				
<b>Requirements:</b> none				
<b>Learning objectives</b> Acquiring basic knowledge and results in the theory of time series, and classical and contemporary methods of time series modelling.				
<b>Learning outcomes</b> At the end of the course students must demonstrate comprehension and knowledge of theoretical fundamentals as well as practical skills in time series modeling, and application of these in economics.				
<b>Syllabus</b>  <i>Theoretical instruction</i> The basic purpose and approach to time series analysis. Descriptive techniques and graphical presentation of time series. Time series fitting in the time domain: estimating the autocovariance function, fitting the moving averages (MA) process, ARMA and ARIMA models. Prediction theory. Spectral analysis. Linear and nonlinear models. Heteroscedasticity: ARCH and GARCH models. Forecasting trend and seasonality. Application of time series in finance.  <i>Practical instruction</i> The exercises follow the topics covered at the theoretical lectures. Solving examples, exercises and real world problems. Modeling of time series using MATLAB and statistical software.				
<b>Literature</b> 1. J. Mališić, <i>Vremenske serije</i> , Matematički fakultet, Beograd, 2002. 2. C. Chatfield, <i>The Analysis of Time Series: An Introduction</i> , Sixth Edition, Taylor & Francis, 2003. 3. R.S. Tsay.: <i>Analysis of Financial Time Series</i> , Wiley, 2002. 4. D.C. Montgomery, C.L. Jennings, M. Kulahci, <i>Introduction to Time Series Analysis and Forecasting</i> , Wiley, 2008.				
<b>Weekly teaching load</b>				Other:
Lectures: 2	Exercises: 3	Other forms of teaching:	Student research:	
<b>Teaching methodology</b> Plenary lectures and problem sessions are conducted by classical teaching methods. On problem sessions, students solve exercises and examples from topics that were covered at theoretical lectures, discuss the solutions and learn to use computers and statistical software to implement and model time series in real world problems.				
<b>Grading method (maximal number of points 100)</b>				
<b>Pre-exam obligations</b>		<b>points</b>	<b>Final exam</b>	<b>points</b>
Colloquia		50	Oral exam	50