

**Program: Doctoral Program**

**Course: Econometrics II: Time Series Analysis**

**Course No.: PhD-14**

**Credits: 2,5**

**Lecturer: Oliver Hoßfeld / Prof. Dr. Wilhelm Althammer**

<p><b>Learning objectives and outcomes</b></p>	<p>The aim of this course is to provide a basic understanding of applied time series analysis. In the first part of the course you will learn how to model and forecast single sequences of data (univariate time series) with the help of several stochastic processes (AR, MA, and ARMA). You will be able to model volatility (ARCH and GARCH), know why it is important whether time series are stationary or not and how to avoid the risk of running “spurious regressions”. In the second part of the course you will gain some first insights into multi-equation time series models such as the VAR model. These models are able to capture interdependencies among variables, which are mostly observed in reality, but often not adequately dealt with in empirical work. The focus of the course is on providing an intuitive understanding of the above mentioned models, not on rigorous mathematical derivations. You will see various practical examples in fields such as finance, marketing and economics and get hands-on-experience in Eviews.</p>
<p><b>Content</b></p>	<ul style="list-style-type: none"> <li>• Introduction to time series analysis</li> <li>• Univariate time series models <ul style="list-style-type: none"> <li>○ Stochastic difference equation models</li> <li>○ ARMA models</li> <li>○ Autocorrelation and partial autocorrelation function</li> <li>○ Box-Jenkins model selection</li> <li>○ ARCH and GARCH models</li> <li>○ Models with trend</li> </ul> </li> <li>• Multivariate time series models <ul style="list-style-type: none"> <li>○ Introduction to VAR analysis</li> <li>○ Cointegration and error-correction models</li> </ul> </li> </ul>
<p><b>Teaching Methods</b></p>	<p>Lectures and exercises</p>
<p><b>Conditions of participation</b></p>	<p>Admission to the HHL Doctoral Program. In order to allow self study, the students receive comprehensive reading material and additional references in advance. Prior econometric knowledge at the level of Econometrics I</p>
<p><b>Application, combination and frequency</b></p>	<p>The course is an elective course. Additionally, 3 other elective courses have to be chosen. The course is held once a year.</p>
<p><b>Conditions for Credit Points and grades</b></p>	<p>Credit Points are awarded for passing the course. The course is passed if the grade of the course is 4,0 or better.  The course contains the following examination: home assignment.  The grades range from 1 to 5.</p>
<p><b>Workload</b></p>	<p>The course “Econometrics II: Time Series Analysis” accounts for 2,5 ECTS, which are equivalent to a total workload of 75 hours.</p>
<p><b>Duration</b></p>	<p>The course extends over one term.</p>
<p><b>Literature</b></p>	<p>tba</p>