

<b>Title of the Modules:</b> Time Series Econometrics	<b>Module - Number:</b>
<b>Module - Abbreviation:</b> NN	<b>Credit Points:</b> 6
<b>Duration:</b> One Semester	<b>Level:</b> Master
<b>Units:</b> This module will be taught in one unit.	<b>Frequency of the Course :</b> Once a year
<b>Teaching Language:</b> English	<b>Form of Examination:</b> Combined Examination
<b>Subject:</b> International Finance and International Economics	<b>Status:</b> Optional Module
<b>Teaching Form, Attendance Time :</b> Seminaristic, Teaching Hours (4 SWS = 72 academic hours of 45 Minutes = 54 hours)	
<b>Time needed for self - studies, examinations, and examination preparation:</b> 126 hours	<b>Total Work Load:</b> 180 hours

### Required Preconditions:

Basic knowledge in statistics, algebra and analysis is required. Advantageous would be a basic knowledge in econometrics (linear regression models)

### Learning Outcomes and Competences:

The major aim of the course is to enable students to model time series data by using proper methodologies and to run forecasts. The focus of this course will be to describe time series by stochastic processes which can mimic the empirical regularities observed in the time series. By relying exclusively on the history of the univariate time series in the modelling process, this approach stands in contrast to e.g. the classical linear regression model.

First, the student will form an understanding of how he can describe and analyse stationary time series. The student will model stationary time series via MA, AR, and ARMA approaches and learn about estimation procedures and hypothesis testing. Moreover, the student will learn how to forecast within these models.

In a second step the student will learn the difference between stationary and non-stationary time series. The student will learn about the pitfalls of using standard estimation procedures with non-stationary time series and how to correctly estimate in this case. Moreover, the error-correction model will be discussed which allows for the inclusion of other variables.

### Content of Course:

1. Distinction between weak, strong, and non-stationary stochastic time series processes
2. Modelling of stationary moving-averages processes and forecasting
3. Modelling of stationary autoregressive time series processes and forecasting

4. Modelling of ARMA processes and forecasting
5. Distinction between deterministic and stochastic trends
6. Problems when dealing with non-stationary time series
7. Testing for unit roots
8. Modelling of non-stationary time series: the error correction model

**Literature Recommendations:**

1. Brooks, Chris (2008), "Introductory Econometrics for Finance", 2<sup>nd</sup> ed., Cambridge.
2. Judge, G. G. et al (1988), "Introduction to the Theory and Practice of Econometrics", 2<sup>nd</sup> ed., Wiley.
3. Kirchgässner, G. & Wolters, J. (2007), "Introduction to Modern Time Series Analysis", Springer.