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## Time Series Econometrics: Syllabus

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**Course URL:** TBA

**Instructor:** Jan Scherer, [jscherer@uni-bonn.de](mailto:jscherer@uni-bonn.de)

**Lectures:** Tue 16:15–17:45h (JUR/Room 0.017), Thu 10:15–11:45h (JUR/Room 0.042).

**Office Hours:** By appointment via email. Please feel free to ask questions during the lectures or after class.

**Course Description:** The course provides an introduction to the theoretical foundations and econometric practice of modern time series analysis. Topics covered include stationary and non-stationary stochastic processes, the Box-Jenkins methodology (ARIMA modeling, model selection, estimation), forecasting, unit root processes, and structural vector autoregressive models. A brief outline is given below:

1. Introduction and basics
2. Univariate and multivariate stationary processes
3. Sample moments of stationary processes
4. ARMA models
5. Estimation, model selection, and forecasting
6. Integrated processes and cointegration
7. Structural vector autoregressive models

**Main Textbooks:**

- Kirchgässner, G., Wolters, J., and Hassler, U. (2013). *Introduction to Modern Time Series Analysis (Second Edition)*. Springer. ([link](#))
- Neusser, K. (2016). *Time Series Econometrics*. Springer.

**Further Literature:**

- Brockwell, P. J. and Davis, R. A. (2016). *Introduction to Time Series and Forecasting (Third Edition)*. Springer. ([link](#))
- Brockwell, P. J. and Davis, R. A. (1991). *Time Series: Theory and Methods (Second Edition)*. Springer.
- Hamilton, J. (1994). *Time Series Analysis*. Princeton University Press.
- Lütkepohl, H. (2005). *New Introduction to Multiple Time Series Analysis*. Springer. ([link](#))
- Kilian, L. and Lütkepohl, H. (2017). *Structural vector autoregressive analysis*. Cambridge University Press.

Some of the books can be downloaded via VPN from the Uni Bonn network (see link)

**Software:** We will apply the methods developed in the lectures to real data sets using open source software.

- Download **R** and **RStudio**: <https://cran.r-project.org/>, <https://www.rstudio.com/products/rstudio/>

**Problem Sets:** We will discuss approximately 6 problem sets (every second week)

**Exam:** Written exam