Course content for International Master program „Mathematical modeling, computation and optimization"

| Course name | Time Series Analysis |
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| Contents and Objectives | Content:<br>• Description of time series,<br>• Applications in finance, economics and industry<br>• Trends,<br>• Seasonality,<br>• Periods,<br>• The correlation function,<br>• Fourier transform,<br>• Relation to stochastic processes,<br>• Prediction,<br>• Sptectrum,<br>• Smoothing<br><br>Objectives of the course:<br>The course addresses essential tools to understand time series analysis, starting from classical time series. We discuss economic situations which allow a meaningful application of time series including trends, periods and seasonality. We further address limitations of time series, particularly when predicting future values.<br>An important component of the lecture is the analysis of real data by employing statistical software as R or SPSS. |
| Teaching | This course consists of lectures and exercise classes.<br>• Lecture: Time Series Analysis (2h/week)<br>• Exercise class: Time Series Analysis (1h/week) |
| Prerequisites | Statistics and probability theory are helpful |
| Examination | Oral exam (30 minutes) |
| Credits | 4 ECTS points |
| Frequency | This course is given at least once in 2 years. |
| Workload | The estimated total working time for this course is 120 hours. |
| Duration | This course is given during one semester. |