Course Title: Time-Based Analytics

Dates: 13 -18 July 2020

Tuition fees:

  - Professionals 1,350 CHF
  - External students: 1,000 CHF
  - UNIGE students: 600 CHF (limited number of places)
  - Early bird fee: no

Course description:

This course gives an overview of the practical settings in which time series analysis is of primary importance. Through the use of real-life examples and simulations, the students are progressively introduced to the formal aspects underlying time-series processes and their implication in data analysis, such as the concept of stationarity and the different forms through which it is possible to characterize the main features of these processes. This is accompanied with an overview of the methods used to estimate the quantities of interest. Using the R statistical software, the students will become familiarized with a set of analytical tools, starting from (properties of) autocovariance functions, proceeding with model estimation, selection and forecasting techniques. Throughout this, students will be lead through the technical details, which will allow them to better understand, interpret and make use of time-based analytic tools. Finally, depending on time, a quick overview of more advanced topics in time series analysis is provided thereby covering heteroskedastic time series (GARCH) and multivariate time series.

At the completion of this course, students will be able to:

- Develop basic R code in order to implement routines (functions) for (time series) data analysis.
- Plot time series in appropriate ways in order to interpret their features.
- Understand the transformations and diagnostics tools required to adequately analyze time series.
- Perform model selection and correctly interpret the output of estimation procedures for time series models.
- Make appropriate use of forecasting techniques based on the observed properties of a time series.

The course is based on the open access e-book:


Course credits: equivalence of 3 ECTS credits (or 3 ECTS per week), based on a personal/group project
Target Audience: students with interests in analytics methods and numerical sciences, who want to acquire basic knowledge of (applied) time series analysis.

Prerequisites: A knowledge of fundamental probability and statistics concepts (e.g. acquired at a non-specialized bachelor level) as well as a beginner-level familiarity with the R statistical programming language are strongly desirable. Therefore, the course is tailored to students and/or professionals who have some basic experience with quantitative analysis tools and wish to increase them while extending their knowledge to the specific field of time series analysis.

Faculty & Staff:

Program Directors:
- Prof. Maria-Pia Victoria-Feser, GSEM, University of Geneva
- Prof. Stephane Guerrier, GSEM, University of Geneva

Instructors:

Prof. Roberto Molinari: Roberto Molinari obtained a Master degree in International Affairs at the LUISS Guido Carli University in Rome, which brought to experiences in the UNECE, ECD and Ernst & Young. He then obtained a PhD in Statistics (University of Geneva) to become Visiting Professor in statistics at the University of California, Santa Barbara (USA) where he taught introductory Statistics and supervised projects in actuarial sciences. After a year as a consultant for international organizations in West Africa, he returned to academia as Lindsay Assistant Professor at Penn State University (USA) where he continues his research and develops courses in non-parametric statistics and time series analysis. His research interests are in robust estimation for time series models, spatial statistics and model selection as well as applied statistics in the fields of economics, finance and medicine.

Prof. Stephane Guerrier: GSEM, University of Geneva

Dr Mucyo Karemera: GSEM, University of Geneva