

Time series analysis

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This course provides a general introduction to the analysis of complex temporal signals, crucial for the understanding of the dynamics of socio-economic systems. The course is divided in three modules

1) Introduction (1 hr) Review of standard tools to analyze time series (Fourier analysis, correlation analysis, Lyapunov exponents, fractal dimensions).

2) Univariate analysis (2 hs) Symbolic analysis, complexity measures, extreme value analysis. 3) Bivariate analysis (2 hs) Statistical similarity measures, mutual information, Granger causality.

4) Multivariate analysis (2 hs) Complex network representation of time series. Applications.