

## Time Series Analysis

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### Course overview

This course deploys the theoretical basis for the analysis of time series and their application to financial and economic problems. A time series is the realization of a stochastic process over time, and their empirical relevance in economics is of crucial importance. Historical data come in the form of time series and understanding the statistical properties of the time series is necessary to uncover the economic dynamics and forecasting. The course will also provide worked examples with a specific programming language.

### Prerequisites

- Basic probability theory
- Basic linear algebra
- Standard calculus

### Topics

(classes may change to adapt to the class learning pace)

1. Introduction to time series (Ch. 1 & 2)
2. ARMA processes (Ch. 3)
3. ARMA processes (Ch. 4 & 5)
4. Unit roots and non-stationarity (Ch. 17)
5. Vector Auto-Regressions (Ch. 11)
6. Cointegration (Ch. 19)
7. Application to macroeconometrics (Ch. 11 + extra)
8. Application to financial econometrics (Ch. 21 + extra)
9. Forecasting (extra)

Reference: Hamilton (1994). Time Series Analysis. Princeton University Press.

A reading list will be discussed and presented in class.