



## ECONOMÉTRIE DES SÉRIES TEMPORELLES

### TIME SERIES ANALYSIS

**Lecturers:** Christian DE PERETTI, Alexandre SAIDI, Marie-Christophette BLANCHET

| Lecturers : 28 | TC : 0.0 | PW : 0.0 | Autonomy : 0.0 | Study : 0.0 | Project : 0.0 | Language : FR

#### Objectives

A time series - or time series - is a sequence of observations indexed by time. The temporal and joint dynamics of time series are modelled by discrete-time stochastic processes. The main applications of time series are the modelling of macroeconomic and financial series. They can also be used in other sciences such as physics, biology, geology (Nile floods, Hurst 1951), health (hormone levels in blood), etc.

The objective of this time series course is to review a large number of econometric models without going into mathematical demonstrations: for univariate stationary (ARMA models, application to short-term interest rates),

**Keywords :** Discrete-time stochastic processes, econometrics, estimation, testing, economic interpretation, neural networks, Eviews software.

#### Programme

Chap 1: Introduction to the concept of time series.  
Chap 2. Autoregressive moving average models (ARMA)  
Basic model.  
+ recurrent neural networks. LSTM.  
Chap 3. Autoregressive conditional heteroskedasticity models (ARCH)  
Models specific to the returns of financial securities.  
They take into account periods of volatility observed in financial markets.  
+ Neural volatility models  
Chap 4. Notion of unit root and ARIMA models

#### Learning outcomes

- Knowledge: time series modelling by stochastic process. Know-how: Applications to macroeconomic and financial problems.

#### Independent study

**Objectifs :** Non.

**Méthodes :**

#### Core texts

Walter Enders, *APPLIED ECONOMETRIC TIME SERIES*, Wiley, 2014

#### Assessment

50% one-hour examination.  
50% project in pairs.