Time series analysis

Lecturer
Yves-Caoimhin SWAN (Coordinator)

Course mnemonic
STAT-F405

ECTS credits
5 credits

Language(s) of instruction
English

Course period
First term

Campus
Plaine

Course content

Table of contents

- Chapter 1: Stationary time series
- Chapter 2: Hilbert spaces
- Chapter 3: ARMA processes
- Chapter 4: Time series data analysis
- Chapter 5: Estimation of the mean and autocovariance function
- Chapter 6: Parameter estimation for ARMA models
- Chapter 7: GARCH models
- Chapter 8: Further topics

Objectives (and/or specific learning outcomes)

A thorough understanding of the mathematical aspects linear time series methods and their manipulation with R software.

Teaching method and learning activities

The theoretical course rests on slides accompanied by an oral presentation. Exercise sheets are provided, along with detailed corrections (both for the mathematical developments as well as the R solutions). You are expected to solve the exercises by yourselves; office hours will be organised (on a scheduled basis) for you to ask your questions.

All information will be provided via the UV and Teams and all other appropriate communication channels.

Contribution to the teaching profile

Within the "Profil d'enseignement Master en Sciences mathématiques", this course contributes to most items of

- 1- Constituer, développer et entretenir des connaissances dans différents domaines des sciences mathématiques
- 2- Résoudre des problèmes en acteur scientifique

Within the "Profil d'enseignement Master en Sciences actuarielles", this course contributes to most items of

- 1- Constituer, développer et entretenir des connaissances dans différents domaines des sciences actuarielles
- 2- Résoudre des problèmes en acteur scientifique

Within the "Profil d'enseignement Master en Sciences des données", this course contributes to most items of

- 1- Constituer, développer et entretenir des connaissances dans différentes disciplines scientifiques
- 2- Résoudre des problèmes en acteur scientifique

References, bibliography and recommended reading

Bibliography

- Brockwell, P.~J., Davis, R.A., and Fienberg, S.E. (1991). Time Series: Theory and Methods: Theory and Methods. Springer Science & Business Media.
- Shumway, R.~H. and Stoffer, D.~S. (2017). Time series analysis and its applications: with R examples. Springer.
- Neusser, K. et~al. (2016). Time series econometrics. Springer.

Other information

Place(s) of teaching

Plaine

Contact(s)

Yvik Swan

mail: yvik.swan@ulb.be

phone: 02/650.58.86

Programmes

Programmes proposing this course at the faculty of Sciences

MA-ACTU | Master in Actuarial Science | finalité Professional/unit 1 and finalité Professional/unit 2, MA-STAT | Master in Statistics : General | finalité Research General/unit 1 and MS-BGDA | Specialized Master in data science, Big data | unit U

Programmes proposing this course at the Solvay Brussels School of Economics and Management

MA-ECOE | Master in Economics : Econometrics | finalité Research in Economics/unit 2 and finalité Research in Economics and statistics/

unit 1 and MS-BGDA | Specialized Master in data science, Big data | unit U

Programmes proposing this course at the Brussels School of Engineering

MS-BGDA | Specialized Master in data science, Big data | unit U