GHENT UNIVERSITY

Course Specifications

Valid as from the academic year 2025-2026

Econometrics: Time Series Analysis (F000676)

Course size *(nominal values; actual values may depend on programme)*

Credits 6.0 **Study time 180 h**

Course offerings and teaching methods in academic year 2025-2026

A (semester 1)	English	Gent	lecture
			group work
			seminar

Lecturers in academic year 2025-2026

Everaert, Gerdie	EB21	lecturer-in-charge

Offered in the following programmes in 2025-2026	crdts	offering
Master of Science in Teaching in Economics(main subject Economics)	6	A
Master of Science in Business Engineering(main subject Data Analytics)	6	A
Master of Science in Business Engineering(main subject Operations Management)	6	A
Master of Science in Economics	6	A
Master of Science in Economics (Double Degree)	6	A
Exchange programme in Economics and Business Administration	6	A

Teaching languages

English

Keywords

Time series analysis, ARMA models, stationarity, non-stationarity, unit root tests, cointegration, VAR models, local projections, panel data

Position of the course

This course builds on basic econometric knowledge and skills, extending them to the specific context of time series analysis and panel data models. The acquired insights are applied in practice through group-based analysis of several case studies.

Contents

- Univariate time series analysis: ARMA models
- Stationarity versus non-stationarity: unit root tests
- Regression analysis with non-stationary series: cointegration analysis
- Multivariate time series analysis: VAR models and local projections
- Panel data: introduction and extension to dynamic models (only for students taking the course for 6 ECTS credits)

Initial competences

For this course, students are expected to:

- have a solid understanding of the classical linear regression model, including its assumptions and potential violations (such as heteroskedasticity, autocorrelation, and endogeneity);
- be able to translate economic questions into econometric models and formulate and test relevant hypotheses;
- critically assess estimation methods based on their statistical properties;
- implement regression models (e.g. in R) and correctly interpret the output.

Final competences

1 Thorough understanding of the specific properties of time series and their application in regression analysis.

2 Basic knowledge of estimation methods for panel data, including extensions to dynamic models (only for students taking the course for 6 ECTS credits).
3 Ability to develop a scientifically grounded step-by-step approach for applying time series methods to practical econometric problems.
4 Ability to independently and critically reflect on the statistical properties of applied methods and translate this into an appropriate methodological choice.
5 Ability to implement time series methods in econometric software (R).
6 Ability to correctly interpret and provide economic meaning to the estimation results.

Conditions for credit contract

Access to this course unit via a credit contract is determined after successful competences assessment

Conditions for exam contract

This course unit cannot be taken via an exam contract

Teaching methods

Group work, Seminar, Lecture

Extra information on the teaching methods

Ex cathedra theoretical lectures.
During the group assignment and tutorials students apply the theory to real problems.
Lectures and tutorials are in English.

Study material

Type: Slides

Name: Slides time series analysis
Indicative price: Free or paid by faculty
Optional: no
Language : English
Available on Ufora : Yes

References

- Enders, W., Applied Econometric Time Series (Second Edition), John Wiley & Sons, 2005
- Hamilton, JD, Time Series Analysis, PrincetonUniversity Press, 1994
- Harris, R., Cointegration Analysis in Econometric Modelling, Prentice Hall, 1995
- Lütkepohl, H. and M. Krätzig, Applied Time Series Econometrics, CambridgeUniversity Press, 2004.
- Wooldridge, J.M., Introductory Econometrics. A Modern Approach, South-Western, 2009.

Course content-related study coaching

Students can contact the course instructor and teaching assistants for content-related support.
All course materials (slides, assignments, exercises, solutions, etc.) are made available via the Ufora platform.

Assessment moments

end-of-term assessment

Examination methods in case of periodic assessment during the first examination period

Oral assessment, Written assessment

Examination methods in case of periodic assessment during the second examination period

Oral assessment, Written assessment

Examination methods in case of permanent assessment

Possibilities of retake in case of permanent assessment

not applicable

Extra information on the examination methods

The evaluation consists of two components: a written exam and an oral exam with written preparation.

- The written exam assesses students' understanding of the concepts covered in the time series analysis part of the course, as well as their ability to apply these

techniques to practical economic problems.
- The oral exam focuses on the panel data component and evaluates students' grasp of this more advanced topic.

In preparation for the exam, students complete a group assignment in which they apply their knowledge to a concrete case study. A substantial part of the written exam tests the correct interpretation of their own solution (R output) to this case. The case study itself is not graded separately.

Students taking the course for 5 ECTS credits are not required to study the panel data component and therefore only take the written exam on time series analysis.

Calculation of the examination mark