# Syllabus

for course at advanced level

**Econometrics 3b: Time Series Data**
**Ekonometri 3b: Tidsseriedata**

**7.5 Higher Education Credits**
**7.5 ECTS credits**

| | |
|---|---|
| **Course code:** | EC7413 |
| **Valid from:** | Autumn 2019 |
| **Date of approval:** | 2013-05-23 |
| **Changed:** | 2019-05-16 |
| **Department** | Department of Economics |
| | |
| **Subject** | Economics |
| **Specialisation:** | A1F - Second cycle, has second-cycle course/s as entry requirements |

**Decision**

This syllabus was approved by the Board of the Department of Economics on May 16, 2019.

**Prerequisites and special admittance requirements**

Admission to this course requires that the student is either (1) enrolled in the Master's Programme in Economics at Stockholm University or the Master's Programme in Banking and Finance, or (2) has (a) eligibility for the Master's Programme in Economics at Stockholm University, and (b) prerequisites equal to the mandatory courses that have been given prior to this course according to the current curriculum for the Master's Programme in Economics.

**Course structure**

| Examination code | Name | Higher Education Credits |
|---|---|---|
| 741A | Econometrics 3b: Time Series Data | 7.5 |

**Course content**

This course introduces students to the knowledge and tools needed for the statistical analysis of time series data. The course is a mixture of lectures and exercises in the computer lab together with the instructor, with a strong emphasis on learning by doing.

**Learning outcomes**

The two main aims of this course are:

• Upon completion of the course, students are expected to be able to formulate and test a hypothesis using time series data

• Students completing this course should be able to read, understand and critically review an empirical report which uses time series data.

After completing the course, students should be able to

• define the following univariate time series models; MA, AR, random walk, random walk with drift, ARMA and ARIMA models.

• explain what stationary, trend stationary and difference stationary processes are.

• use the most common methods for analysing both long-run and seasonal trends in time series data.

• apply the Box-Jenkins method to construct a forecast of a univariate time series and evaluate the estimated model and the predictions it produces.

• discuss both the strengths and weaknesses of the univariate time series methods studied in part 1 of this course.

• define the following multivariate time series models; autoregressive distributed lag (ADL), error-correction (EC), vector autoregression (VAR) and vector error-correction (VEC) models.

• explain what a "spurious" regression is and what cointegration is as well as discuss why these two concepts are particularly important for time series analysis.

• explain what Granger causality is and test for its existence between two time series variables.

• construct and estimate a multivariate time series model.

• interpret the results produced by a multivariate time series model.

• discuss the strengths and weaknesses of the multivariate time series methods presented in this part of the course.

**Education**
Instruction will be in the form of lectures and hands-on exercises in the computer lab. The course will be in English.

**Forms of examination**
The course is examined on the basis of a written examination.

Grades will be set according to a seven-point scale related to the learnig objectives of the course. Passing grades include grades A, B, C, D, E, where A is the highest and E is the lowest. Failing grades include F and FX. Grade F is lower than grade FX.

Grading criteria:

A (Excellent): The student can  formulate and test a hypotheses with time series data with very great skill and critically review and analyze an empirical report with time series data with very great skill.

B (Very Good): The student can  formulate and test a hypotheses with time series data with great skill and critically review and analyze an empirical report with time series data with great skill.

C (Good): The student can  formulate and test a hypotheses with time series data with skill and critically review and analyze an empirical report with time series data with skill.

D (Satisfactory): The student can  formulate and test a hypotheses with time series data and critically review and analyze an empirical report with time series data.

E (Adequate): The student can largely formulate and test a hypotheses with time series data and largely critically review and analyze an empirical report with time series data.

FX (Inadequate)/F (Totally inadequate): The requirements for E are not fulfilled, where FX is marginally better than F.

**Interim**
In the event that this course is no longer offered in the course programme, students will have at least three opportunities to re-take the exams, once each semester in the three semesters after the course was last given.

**Limitations**
This course may not be included in a degree together with EC7404- Econometrics 2b: Time Series Data.

**Misc**

The course is also included in the subject of econometrics.

**Required reading**
See course homepage available from www.ne.su.se.