

# Syllabus

for course at advanced level

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

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

<b>Course code:</b>	EC7413
<b>Valid from:</b>	Spring 2020
<b>Date of approval:</b>	2013-05-23
<b>Changed:</b>	2019-11-21
<b>Department</b>	Department of Economics
<b>Subject</b>	Economics
<b>Specialisation:</b>	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 November 21, 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

<b>Examination code</b>	<b>Name</b>	<b>Higher Education Credits</b>
741B	Assignments	2
741C	Pre-seminar	0.5
741D	Course Essay	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:

- to be able to formulate and test a hypothesis using time series data
- to write, read, understand and critically review an empirical report which uses time series data.

After completing the course, students should more specifically 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 stochastic processes are.
- use the most common methods for analysing both long-run and seasonal trends in time series data.
- identify, estimate and diagnose an ARIMA model, use the model to make forecasts and evaluate them.
- discuss both the strengths and weaknesses of the univariate time series methods studied in the course.
- define, estimate and interpret the following multivariate time series models; autoregressive distributed lag (ADL), error-correction (EC), vector autoregression (VAR) and vector error-correction (VEC) models.
- use VAR models to make forecasts and evaluate them and for economic analysis with impulse response functions.
- explain what a "spurious" regression and cointegration is and 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.
- 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 examination consists of:

- Three assignments carried out in groups of two,
- compulsory pre-seminar at the end of the course, where each student verbally discusses a preliminary version of the course essay, and
- individually completed course essay.

The examiner can, if special circumstances exist, allow other assignment-group constalations. Assignments and the pre-seminar are examined with the passing grade G and failing grade U. Grading of the course essay are set according to a 7-tier goal related scale. 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.

The final course grade is given according to the 7-tier grading system and set according to the grade on the course essay when the assignments and the pre-seminar are both examined with a passing grade.

### **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](http://www.ne.su.se).