



School of Economics and Management

## NEKP34, Economics: Econometric Theory, 7.5 credits

*Nationalekonomi: Ekonometrisk teori, 7,5 högskolepoäng*  
Second Cycle / Avancerad nivå

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### Details of approval

The syllabus is an old version, approved by The Board of the Department of Economics on 2011-06-07 and was valid from 2011-06-07, autumn semester 2011.

### General Information

This is a single subject master course in economics. The course is either obligatory or optional within a number of master programmes at Lund University.

*Language of instruction:* English

Teaching is in English. (Teaching may be in Swedish if all registered students have a good knowledge of Swedish).

*Main field of studies*

Economics

*Depth of study relative to the degree requirements*

A1F, Second cycle, has second-cycle course/s as entry requirements

### Learning outcomes

#### Knowledge and understanding

Students shall:

- have a deeper understanding of linear and nonlinear regression models, including the representation using matrix algebra,
- be able to estimate linear and nonlinear models using least squares, generalised least squares, maximum likelihood, instrumental variables and GMM, and have an understanding of when these methods should be used,
- have a deeper understanding of the statistical properties of OLS,
- be able to formulate and test linear and nonlinear hypotheses and to create confidence intervals,
- be able to use simulation methods for estimation and testing including, but not limited to, bootstrap,

- have a good understanding of maximum likelihood and GMM and the asymptotic properties of these estimation techniques,
- be able to analyse panel data models,
- be able to generalise their knowledge to econometric problems that haven't been treated during the course,
- be able to understand relevant empirical and econometric research.

### **Competence and skills**

Students shall have the ability to independently:

- apply advanced econometric tools to economic problems,
- evaluate whether the assumptions made by the chosen model are reasonable,
- apply rational modelling strategies even when basic assumptions must be rejected,
- implement econometric analyses using econometric software,
- give an account of and discuss their econometric abilities.

### **Judgement and approach**

Students shall have developed the ability to pursue further studies in the subject and should be able to search for and evaluate information with a high degree of independence. Students shall also have developed the ability to individually write an empirically orientated essay at the master level.

### **Course content**

This course gives a complete treatment of the linear and nonlinear regression model with one equation and a continuous dependent variable. The course gives the basis that is needed to enable students to empirically analyse economic data without making unrealistic assumptions. Emphasis is placed on geometrical interpretation, asymptotic results and simulation techniques. Theoretical studies are interwoven with practical applications in the form of computer exercises, which are carried out using econometric software on a PC. The course contains the following:

- Review of regression analysis using matrix algebra
- The geometry of method of moments and OLS
- Statistical properties of OLS
- Hypothesis testing and confidence intervals in linear models
- Nonlinear regression and hypothesis testing
- Generalized least squares
- Instrumental variables
- Generalized method of moments
- Maximum likelihood

No specific gender perspective is adopted in this course.

### **Course design**

1. Teaching: Tuition consists of lectures and compulsory computer exercises.

## Assessment

1. Examination: This course is examined by a number of compulsory assignments and quizzes. Assignments and computer exercises will be completed in a group of two to three students while the quizzes must be completed individually. All the assignments, quizzes and computer exercises must be completed to pass the course. Other forms of examination may be used to a limited extent.
2. Limitations on the number of examination opportunities: –

The University views plagiarism very seriously, and will take disciplinary action against students for any kind of attempted malpractice in connection with examinations and assessments. Plagiarism is considered to be a very serious academic offence. The penalty that may be imposed for this, and other unfair practices in examinations or assessments, includes suspension from the University for a specified period.

*Subcourses that are part of this course can be found in an appendix at the end of this document.*

## Grades

Marking scale: Fail, E, D, C, B, A.

1. Grading: The official grading scale is A, B, C, D, E and Fail.
2. Weighting grades from different parts of the course: –
3. Grading scales for different parts of the course: –

## Entry requirements

Students who have been admitted to a Master Programme in Economics or the Master Programme in Economic Research Methods and have taken at least 30 ECTS-credits at the advanced level including NEKN31 "Advanced Econometrics" are eligible to take this course. For other students at least 90 ECTS-credits in economics are required. These must include 30 ECTS-credits at the advanced level, including NEKN31 "Advanced Econometrics", NEKP33 "Statistical Methods for Econometrics" and NEKN01 "Master Essay I", or their equivalents.

## Further information

1. Transitional regulations: This course replaces NEKM53 "Econometric Theory".
2. Limitations in the period of validity: –
3. Limitations: This course may not be included in the same degree as NEK719 "Advanced Econometrics" or NEKM53 "Econometric Theory".
4. Similar courses: –
5. Limitations in renewed examination: –

## Subcourses in NEKP34, Economics: Econometric Theory

Applies from V13

1101 Econometric Theory, 7,5 hp  
Grading scale: Fail, E, D, C, B, A