



School of Economics and Management

## NEKP35, Economics: Econometric Theory, 15 credits

*Nationalekonomi: Ekonometrisk teori, 15 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 2018-10-09 and was valid from 2018-10-09, spring semester 2019.

### 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.

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 the econometric results presented in this course,
- understand the geometrical perspective of econometric theory,
- be able to understand relevant empirical and econometric research,
- understand concepts from probability theory and statistics relevant to econometric theory,
- understand concepts from linear algebra relevant to econometric theory,
- have basic knowledge of programming.

### Competence and skills

Students shall have the ability to independently:

- apply advanced econometric tools to economic problems,
- critically review and evaluate assumptions and implementation of econometric analysis,
- apply rational modelling strategies even when basic assumptions must be rejected,
- implement econometric analyses using econometric software,
- implement econometric analyses by writing their own code.

### **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.

### **Course content**

The content is as follows:

- Linear algebra (advanced matrix algebra, vector spaces, subspaces, metric spaces, spectral theorem),
- Mathematics (measure theory, Lebesgue integral, Stieltjes integral, multivariable calculus),
- Numerical analysis (numeric optimization, numeric derivative and numeric integration),
- Probability theory (probability spaces, random variable, random vector, moments, functions of random variables, moment generating functions),
- Asymptotic analysis (convergence in probability, law of large numbers, central limit theorems),
- Statistic (estimator, properties of an estimator, inference),
- Regression analysis from a geometric perspective,
- The statistical properties of the OLS estimator and inference,
- Non-linear regression analysis,
- Generalized regression analysis,
- Endogeneity and instrumental variables,
- Analysis of moments: method of moments and generalized method of moments,
- The maximum likelihood method,
- Simulation methods (Bootstrap, SMM).

### **Course design**

1. Teaching: Tuition consists of lectures.

### **Assessment**

1. Examination: Examination consists of a written examination that takes place at the end of the course. There will be further opportunities for examination close to this date. In addition, there is a set of home assignments. 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.

The examiner, in consultation with Disability Support Services, may deviate from the regular form of examination in order to provide a permanently disabled student with a form of examination equivalent to that of a student without a disability.

*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: Grade (Definition), Points or percentage out of maximum points, Characteristic

A (Excellent), 85–100, A distinguished result that is excellent with regard to theoretical depth, practical relevance, analytical ability and independent thought.

B (Very good), 75–84, A very good result with regard to theoretical depth, practical relevance, analytical ability and independent thought.

C (Good), 65–74, The result is of a good standard with regard to theoretical depth, practical relevance, analytical ability and independent thought.

D (Satisfactory), 55–64, The result is of a satisfactory standard with regard to theoretical depth, practical relevance, analytical ability and independent thought.

E (Sufficient), 50–54, The result satisfies the minimum requirements with regard to theoretical depth, practical relevance, analytical ability and independent thought, but not more.

U (Fail), 0–49, The result does not meet the minimum requirements with regard to theoretical depth, practical relevance, analytical ability and independent thought.

Students have to receive a grade of E or higher in order to pass a course.

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" and NEKN01 "Master Essay I", or their equivalents.

## Further information

1. Transitional regulations: This course replaces NEKP33 "Statistical Methods for Econometrics" and NEKP34 "Econometric Theory".

2. Limitations in the period of validity: –

3. Limitations: This course may not be included in the same degree as NEK/18 "Statistical Methods for Econometrics", NEK719 "Advanced Econometrics", NEKM52 "Statistical Methods for Econometrics", NEKM53 "Econometric Theory", NEKP33

“Statistical Methods for Econometrics” or NEKP34 “Econometric Theory”.

4. Similar courses: –

5. Limitations in renewed examination: –

## Subcourses in NEKP35, Economics: Econometric Theory

Applies from V19

1801 Econometric Theory, 15,0 hp  
Grading scale: Fail, E, D, C, B, A