



**LUND**  
UNIVERSITY

School of Economics and Management

## **NEKN32, Economics: Mathematical Methods, Advanced Level, 7.5 credits**

*Nationalekonomi: Matematiska metoder, avancerad nivå, 7,5 högskolepoäng*  
Second Cycle / Avancerad nivå

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### **Details of approval**

The syllabus was approved by The Board of the Department of Economics on 2016-11-15 and was last revised on 2022-09-13. The revised syllabus applies from 2023-01-16, spring semester 2023.

### **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 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*

A1N, Second cycle, has only first-cycle course/s as entry requirements

### **Learning outcomes**

#### **Knowledge and understanding**

Students shall:

- have a good knowledge of the mathematical tools covered in the course,
- understand how to use the mathematical tools in different contexts,
- be familiar with basic mathematical notation.

#### **Competence and skills**

Students shall be able to:

- use the mathematical tools covered in the course,
- apply the mathematical tools to relevant economic and econometric applications,
- use mathematical notation to formulate economic problems.

### **Judgement and approach**

Students shall have an understanding of how and when to apply the mathematical tools in economic theory and of how to analyse economic and econometric problems.

### **Course content**

The content of the course is the following topics:

- Elementary set theory (set inclusion, union, intersection),
- Elementary number theory (natural numbers, rational numbers, real numbers),
- Elementary functions (polynomial, exponential, logarithmic),
- Differentiation (basic rules, differentiation of elementary functions, total and partial, chain rule),
- Constrained optimization with equality and inequality constraints (Lagrange and Kuhn–Tucker),
- Convergence of series and limits (simple cases),
- Integration (basic rules, integration of elementary functions, one variable),
- Linear algebra (basic operations with matrices and vectors),
- Basic probability theory (what probabilities are, expected value, expectations operator, Bayes rule).

### **Course design**

1. Teaching: Tuition consists of lectures and exercises.

### **Assessment**

1. Examination: The examination consists of a written exam and mandatory or other home assignments. The written exam takes place at the end of the course. There will be further opportunities for examination close to this date. Other forms of examination may be used to a limited extent.

2. Limitations on the number of examination opportunities: –

The University views plagiarism and other academic dishonesty 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 admitted to the Master Programme in Economics are qualified for this course. For other students, at least 90 ECTS-credits in economics are required.

## Further information

1. Transitional regulations: –

2. Limitations in the period of validity: –

3. Limitations: –

4. Similar courses: –

5. Limitations in renewed examination: –

Subcourses in NEKN32, Economics: Mathematical Methods, Advanced Level

Applies from H17

1601 Mathematical Methods, Advanced level, 7,5 hp  
Grading scale: Fail, E, D, C, B, A