

**SYLLABUS**

# **Applied Mathematical Economics 7.5 credits N0005N**

**Nationalekonomi B, Tillämpad matematik för Nationalekonomer**

**Course syllabus admitted: Autumn 2023 Sp 1 - Present**

**DECISION DATE  
2023-02-15**

# Applied Mathematical Economics 7.5 credits N0005N

## Nationalekonomi B, Tillämpad matematik för Nationalekonomer

### First cycle, N0005N

**Education level**  
First cycle

**Grade scale**  
U G VG \*

**Subject**  
Nationalekonomi

**Subject group (SCB)**  
Economics

### Main field of study

Economics

## Entry requirements

In order to meet the general entry requirements for first cycle studies you must have successfully completed upper secondary education and documented skills in English language and completed courses of at least 30 credits in Economics with at least the grade Pass. The following courses should be included: Introductory Microeconomics (N0008N) 7,5 credits and Introductory Macroeconomics (N0011N), 7,5 credits, or equivalent. Good knowledge in English, equivalent to English 6.

## Selection

The selection is based on 1-165 credits.

## Course Aim

After the course the student should have the ability to apply mathematical methods to analyze economic problem in higher studies in economics. Specifically, this means that the student should have the ability to without the support of a mathematical manual be able to:

- Simplify linear and non-linear functions and interpret economic information from these functions.
- Solve linear and non-linear equations.
- Solve systems of linear equation with more than two unknown variables.
- Apply rules of differentiation on economic problems with the purpose of doing comparative static analysis and for solving economic optimization problems.
- Use integration for calculating economic areas such as consumer surplus and producer surplus.
- Use spreadsheet software, such as Excel, to perform economic calculation and for presenting both input and output data, in a written report.

## Contents

The course contents:

- linear and non-linear equations
- Algebra.
- Solving equations with the method of elimination.
- Quadratic functions.
- Exponential and logarithm functions.
- Economic application.

### Differentiation

- The slope of the tangent.
- Rules of differentiation.
- Marginal functions.
- Elasticity.
- Partial differentiation.
- Comparative static.
- Optimization of economic problems with one and two unknown variables.
- Optimization of constrained economic problems.
- The Lagrange multiplier and its economical interpretation.

### Integration

- Indefinite and definite integration.
- Economic application.

### Matrices

- Matrix algebra.
- Solving linear systems of equation by using matrix inversion.
- Solving linear systems of equation by using Cramer's rule.

Solving economic problem and present the result by using spreadsheet software.

## Realization

Each course occasion's language and form is stated and appear on the course page on Luleå University of Technology's website.

The teaching will be given in the form of lectures and computer labs.

## Examination

If there is a decision on special educational support, in accordance with the Guideline Student's rights and obligations at Luleå University of Technology, an adapted or alternative form of examination can be provided. Written exam and written lab exercises. The exam will not be marked before the written lab exercise is approved.

## Unauthorized aids during exams and assessments

If a student, by using unauthorized aids, tries to mislead during an exam or when a study performance is to be assessed, disciplinary measures may be taken. The term "unauthorized aids" refers to aids that the teacher has not previously specified as permissible aids and that may assist in solving the examination task. This means that all aids not specified as permissible are prohibited. The Swedish version has interpretative precedence in the event of a conflict.

## Remarks

Students must register for the courses themselves or contact ETKS educational administration, [eduetks@ltu.se](mailto:eduetks@ltu.se) not later than three days after the quarter commences. Failure to do so can result in the place being lost. This rule also applies to students with a guaranteed place.

Undergraduate level, progression B

## Overlap

The course N0005N is equal to IEN326

## Course offered by

Department of Social Sciences, Technology and Arts

## Modules

Code	Description	Grade scale	Cr	Status	From period	Title
0001	Written exam	U G VG *	6	Mandatory	A07	
0002	Written assignment	U G#	1.5	Mandatory	A07	

## Study guidance

Study guidance for the course is to be found in our learning platform Canvas before the course starts. Students applying for single subject courses get more information in the Welcome letter. You will find the learning platform via My LTU.

## Last revised

by Director of Undergraduate Studies Daniel Örtqvist, Department of Business Administration, Technology and Social Sciences 2023-02-15

## Syllabus established

by Department of Business Administration and Social Sciences 2007-02-28