School of Economics and Management

NEKP31, Economics: Mathematical Methods - Static Optimisation, 7.5 credits

Nationalekonomi: Matematiska metoder - statisk optimering, 7,5 högskolepoäng

Second Cycle / Avancerad nivå

Details of approval

The syllabus was approved by The Board of the Department of Economics on 2011-06-07 and was last revised on 2015-11-04. The revised syllabus applies from 2015-11-04, autumn semester 2016.

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	*Depth of study relative to the degree requirements*
Economics	A1N, Second cycle, has only first-cycle course/s as entry requirements

Learning outcomes

Knowledge and understanding

Students shall:

- be familiar with and understand basic topological concepts such as limits, continuity, and open, closed and compact sets,
- understand fundamental aspects of order relations such as reflexivity, symmetry, transitivity, equivalence and equivalence classes,
- be familiar with and understand the Kuhn-Tucker theory for solving constrained optimisation problems.

Competence and skills

Students shall have the ability to independently:

- apply basic topological concepts such as limits, continuity, and open, closed and compact sets to optimization problems,
- apply the tools of elementary calculus in solving optimisation problems in one or several variables,
- apply the Kuhn-Tucker theory for solving constrained optimisation problems,
- analyse and solve optimisation problems typically encountered in economics,
- evaluate the implications of the theoretical assumptions needed for the applicability of different mathematical methods,
- describe and discuss their mathematical knowledge.

Judgement and approach

Students shall have a command of mathematical theory so as to be able to lay the foundation for independent acquisition of economic theory based on mathematical methods, and to deepen their knowledge of mathematics with applications to economics.

Course content

The course presents mathematical methods that are used in ordinary economic theory for analysing static problems. In simple terms, the course deals with static optimisation. The use of these mathematical methods is exemplified with selected economic problems. The first part of the course deals with elementary topological concepts, for example open, closed and compact sets, and continuity. Many existence theorems in economics build upon these concepts. This is followed by calculus and the Kuhn-Tucker theory (static optimisation).

Course design

1. Teaching: Tuition consists of lectures and exercises.

Assessment

1. Examination: Written exams take place at the end of the course. There will be further opportunities for examination close to this date.

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: 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 the Master Programme in Economics – two years or the Master Programme in Economic Research Methods and who have taken the course NEKN21 "Advanced Microeconomic Analysis" are eligible to take this course. For other students at least 90 ECTS-credits in economics are required.

Further information

1. Transitional regulations: This course replaces NEKM33 "Mathematical Methods – Static Optimisation".

2. Limitations in the period of validity: –

3. Limitations: This course may not be included in the same degree as NEK716 "Mathematical Methods – Static Optimisation" or NEKM33 "Mathematical Methods – Static Optimisation".

4. Similar courses: –

5. Limitations in renewed examination: –

Subcourses in NEKP31, Economics: Mathematical Methods - Static Optimisation

Applies from H11

1101 Mathematical Methods - Static Optimisation, 7,5 hp
Grading scale: Fail, E, D, C, B, A