Department of Mathematics
(incl. Math. Statistics)

Stockholm University

Syllabus

for course at first level

Mathematics III - Logic
Matematik III - Logik

7.5 Higher Education Credits
7.5 ECTS credits

Course code:	MM5024
Valid from:	Autumn 2015
Date of approval:	2014-10-06
Department	Department of Mathematics (incl. Math. Statistics)
Main field:	Mathematics/Applied Mathematics
Specialisation:	G2F - First cycle, has at least 60 credits in first-cycle course/s as entry requirements

Decision

This syllabus was approved by the Board of the Faculty of Science at Stockholm University on 6 October 2014.

Prerequisites and special admittance requirements

Admission to the course requires knowledge equivalent to 60 credits in mathematics, where Mathematics II - Algebra and Combinatorics, 7.5 credits (MM5013), or equivalent, is included.

Course structure

Examination code	Name	Higher Education Credits
HELA	Mathematics III - Logic	7.5

Course content

The course covers: Boolean algebra, propositional calculus and predicate logic. For this, the following tools are introduced: inductively defined sets, formal languages, substitution, semantics (interpretations, valuations) and formal systems (natural deduction). The soundness and completeness with respect to the semantics is proved and applied on various problems.

Learning outcomes

It is expected that the student after taking the course will be able to:
* use Boolean algebra to solve simple logical problems
* express mathematical statements as formulas in predicate logic
* interpret formulas in predicate logic as mathematical statements
* prove formulas in natural deduction
* prove that certain formulas cannot be proven
* show understanding in that a formula can be interpreted in different ways and use this to solve problems
* use some further logical tools in problem solving.

Education

Instruction consists lectures and exercises.

Forms of examination

a. The course is examined as follows: Knowledge assessment takes the form of written examination.

b. Grades are assigned according to a seven-point goal-related grading scale:
A = Excellent
B = Very good
C = Good
D = Satisfactory
E = Sufficient
Fx = Fail (more work required before credit can be awarded)
F = Total fail

c. The grading criteria will be distributed at the beginning of the course.

d. To be awarded a pass, the minimum grade E is required.

e. Students who fail an ordinary examination are entitled to sit additional examinations as long as the course is offered. There is no restriction on the number of examinations. Examinations also include other obligatory elements of the course. Students who have passed an examination may not resit it in order to achieve a higher grade. Students who have failed on two occasions are entitled to request the appointment of a different examiner for the next examination. Any such request must be made to the departmental board. The course has at least two examinations for each academic year in the years in which instruction is provided. Intervening years include at least one examination.

f. Students awarded the grade Fx are given the opportunity to improve their grade to E. The examiner decides the supplementary assignments to be performed and the pass mark criteria. The supplementary assignments will take place before the next examination session.

Interim

Students may request that the examination be conducted in accordance with this course plan even after it has ceased to be valid. However, this may not take place more than three times over a two year period after course instruction has ended. Requests must be made to the departmental board. The provision also applies in the case of revisions to the course plan.

Limitations

The course may not be included in a degree together with the course Logic (MM7008).

Misc

The course is a component of the Bachelor's programmes in Mathematics, Mathematics and Philosophy, and Computer Science, but it can also be taken as an individual course.

Required reading

Course literature is decided by the departmental board and described thereafter in an appendix to the course plan.