LOG260   Models of Computation, 7.5 credits
Modeller för beräkningsbarhet, 7,5 högskolepoäng
Second Cycle

Confirmation
This course syllabus was confirmed by Department of Philosophy, Linguistics and Theory of Science on 2021-11-08 and was last revised on 2023-05-29 to be valid from 2024-01-15, spring semester of 2024.

Field of education: Science 100%
Department: Department of Philosophy, Linguistics and Theory of Science

Position in the educational system
The course can be part of the following programme: 1) Logic, Master's (120 credits) programme (H2LOG) and can also be given as a freestanding course.

Main field of studies	*Specialization*
Logic	A1F, Second cycle, has second-cycle course/s as entry requirements

Entry requirements
For admission to the course successful completion of Logical theory (LOG111), or the equivalent, is required. English 6 or equivalent is also required.

Learning outcomes
On successful completion of the course the student will be able to:

Knowledge and understanding
- demonstrate advanced knowledge and understanding of the different models of computability that are discussed in the course,
- relate these models to one another,

Competence and skills
- formulate and present proofs of the most important results in the course as well as of lemmas that are used in the proofs,
- apply the theoretical results and methods of the course,

Judgement and approach
- critically discuss, analyse and evaluate the results in the course as well as their applications.

Course content

A model for computability describes how, and if, a function or operation can be computed. The course covers many such models and how these models are related to one another. Central results and concepts in the subject area are also discussed. The course content includes:

- Finite automata
- Regular and context-free languages
- Turing computability and recursive functions
- The recursion theorem and relative Turing computability
- Basic results in complexity theory

The students will also specialise in one of the areas, for example through applying the theoretical results in the course.

Form of teaching

Teaching is given in the form of lectures and individual assignments or group assignments.

Language of instruction: English

Assessment

The course is assessed individually through a written exam, an oral presentation of parts of the course content, and compulsory homework assignments during the course. The marking teacher may request supplementation of the examined student performance.

A student who has taken two exams in a course or part of a course without obtaining a pass grade is entitled to the nomination of another examiner. The student needs to contact the department for a new examiner, preferably in writing, and this should be approved by the department unless there are special reasons to the contrary (Chapter 6 Section 22 of the Higher Education Ordinance).

If a student has received a recommendation from the University of Gothenburg for

special educational support, where it is compatible with the learning outcomes of the course and provided that no unreasonable resources are required, the examiner may decide to allow the student to sit an adjusted exam or alternative form of assessment.

In the event that a course has ceased or undergone major changes, students are to be guaranteed at least three examination sessions (including the ordinary examination session) over a period of at least one year, but no more than two years, after the course has ceased/been changed. The same applies to placements and professional placements (VFU), although this is restricted to just one additional examination session.

Grades
The grading scale comprises: Pass with Distinction (VG), Pass (G) and Fail (U).
All parts in the examination (written examination, oral presentation, and homework assignments) should be approved by examiner to get a passing grade. To receive a Pass with distinction, it is furthermore required that the written examination receives the assessment Pass with distinction.

Course evaluation
Students who are currently taking the course or have completed it will be given the opportunity to express their views and share their experiences in an anonymous course evaluation.A compilation of the course evaluation and the course coordinator's reflections on it will be made available to the students within reasonable time after the end of the course.The next time the course is taught the compilation and any measures based on it will be presented to the students.

Additional information
The course requires access to a computer (or the equivalent) with Internet connection.