Study programme(s): Mathematics (PhD studies)

Level: PhD studies

Course title: Mathematical logic 2

Lecturer: Boris B. Šobot

Status: elective

ECTS: 10

Requirements: none

Learning objectives

Introducing students to recursion theory, ways of formalizing the notion of algorithm, as well as several advanced topics in the subject.

Learning outcomes

Minimal: Students should be able to fully understand the notion of recursiveness and related notions, as well as to prove recursiveness of specific functions and sets. They should also be able to estimate complexity of some important algorithms.

Desirable: Students should master the proofs of some more complex theorems, in particular Gödel's incompletness theorems.

Syllabus

Primitive recursive and recursive functions. Recursive sets. Partially recursive functions. The Ackermann function. Some models of computing machines. Estimating the complexity of algorithms, complexity classes. Some undecidable problems. Nondeterminity. P=NP problem. Gödel-s incompletness theorems.

Literature

1. I. Dolinka, *Kratak uvod u analizu algoritama*,PMF Novi Sad, 2008.
2. S. Hedman, *A first course in logic*, Oxford university press, 2004.

Weekly teaching load				Other:
Lectures: 2	Exercises:0	Other forms of teaching: 0	Student research: 6	0

Teaching methodology

Lectures are presented using classical teaching methods supported by beamer presentations and continuous interaction with students. The abillity of application of theoretical knowledge is checked through independent solving of exercises on two colloquia. The final exam is oral and a student is supposed to demonstrate general understanding of the presented theoretical material.

Grading method (maximal number of points 100)

Pre-exam obligations	**points**	**Final exam**	**points**
Colloquia	50	Oral exam	50