Study programme(s): Computer Science

Level: master

Course title: Model Theory in Computer Science

Lecturer: Maja Pech

Status: elective

ECTS: 6

Requirements: ---

Learning objectives
In this course students shall acquire basic knowledge in model theory and will understand fundamental model theoretic results, as well as their applications in mathematics and computer science.

Learning outcomes
At the end of the course a successful student will be able to formulate and solve standard model theoretical problems, to apply standard techniques to examples and to explain applications.

Syllabus
The course will include:

- Basic definitions and results (e.g. classifying structures by formulas, relation of preservation, quantifier elimination, types, etc.)
- Classical model theoretical results (e.g. Löwenheim-Skolem theorems, back-and-forth techniques, compactness for first-order logic and consequences, etc)
- Special topics and applications (e.g. skolemization, categoricity, etc.)

Literature
W. Hodges, A Shorter Model Theory, 1997.
C. C. Chang, H. J. Keisler, Model Theory, 3rd Ed., Dover 2012
B. Poizat: „ A Course in Model theory“, Springer 2000

Weekly teaching load				Other: **0**
Lectures: 2	Exercises: 2	Practical Exercises: 0	Student research: 0	

Teaching methodology
Lectures are presented using classical teaching methods supported by beamer presentations and continuous interaction with students. The ability 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**
Colloquium 1	**20**	*Oral exam*	*60*
Colloquium 2	**20**		