

LECTURE ANNOUNCEMENT

DISCRETE MATHEMATICS

LECTURE (368.113) AND EXERCISE CLASSES (368.115)

PREREQUISITES FOR THE COURSE

Basic knowledge on functions and sets as introduced in first year lectures for mathematics or computer science.

LANGUAGE OF INSTRUCTION

The course will be taught in German or English, according to the preferences of the participants.

CONTENT OF THE COURSE

Discrete Mathematics studies a large variety of finite objects, such as graphs, finite geometries or finite automata. This course gives an introduction to this field, and in particular to research topics at the department of algebra. Topics covered are:

- (1) Finite automata and their languages.
- (2) Functions on finite sets, essential variables, clones.
- (3) Hall's Marriage Theorem and systems of distinct representatives.
- (4) Graphs. Hamiltonian Graphs and Computational Complexity.
- (5) Generating functions and their relation to combinatorial structures.

LITERATURE

- (1) N. Pippenger, Theories of computability, Cambridge University Press, Cambridge, 1997.
- (2) P. Flajolet and R. Sedgewick, Analytic Combinatorics, Cambridge University Press, 2009.
- (3) D. Masulovic, The Discrete Charm of Discrete Mathematics, Lecture Notes, 2006, <http://www.algebra.uni-linz.ac.at/Students/DiskreteMathematik/ss08/Ma-DCODM05.pdf>,
- (4) E. Aichinger, Basics of Clone Theory, Lecture Notes, <http://www.algebra.uni-linz.ac.at/Students/UniversalAlgebra/s11/clonebasics5.pdf>

EXERCISES

Problems will be handed out each week, and the students will present their solutions on the blackboard.

ORGANISATION

The lecture starts on October 4, 8:30, S3 058. Organisational details will be discussed in this meeting. On October 4, instead of the exercise class, there will be a lecture also from 10:15-11:00.

Please use <http://www.kusss.jku.at> to register for this course.