

ITT9131 COURSE

Course code: ITT9131

Course title: Concrete Mathematics

ECTS credits: 9.00

Assessment form: Examination

Language: English

Teaching semester: autumn - spring

Course aims: The purpose of this course is to provide students with the fundamental concepts and methods of concrete mathematics relevant to computing and information technology. First of all, this is studied how problems of standard discrete mathematics can often be solved by methods based on continuous mathematics together with a controlled manipulation of mathematical formulas.

Brief description of the course: Selected topics of discrete mathematics that support advanced computer programming and the analysis of algorithms. Selection is made from the following topics according to interests and preliminary knowledge of students. 1) Sums: Sums and recurrences, Manipulation of sums, Multiple Sums, General methods of summation Finite and Infinite calculus, Infinite sums; 2) Integer Functions: Floors and ceilings, Floor/Ceiling applications, Floor/Ceiling recurrences, Floor/Ceiling sum; 3) Binomial Coefficients: Basic Identities, Applications, Generating functions for binomial coefficients; 4) Generating Functions: Basic manoeuvres, Solving recurrences, Convolutions, Exponential generating functions; 5) Asymptotics : O notation, O manipulation, Bootstrapping, Trading tails, Eulers summation formula.

Learning outcomes in the course: Understanding of the concrete mathematics topics covered and the necessary skills for solving a range of concrete mathematics problems encountered in computing and information technology.

Type of assessment: Tests, oral/written exam.

Study literature: 1. Graham, R. M., D. E., Knuth & O. Patashnik Concrete Mathematics, A Foundation for Computer Science, Addison Wesley, 1994.

Prerequisite(s): YMA5720, ITT0030

Work load:

	Full-time studies	Distance learning
Lectures	2.0	
Practices	0.0	
Exercises	2.0	

Independent study: Exercises of problem solving. Writing seminar papers / composing of seminar presentations.

Confirmed: 30.08.2016

Study programmes that contain the course: