

Algorithm Analysis

Lecturer: Mirzagitov Azat

Semester: 3 **Duration:** 18 weeks

Workload (h): 108 **Presence (h + CH):** 64 (8) **Self-Study (h):** 36

Contents:

Background and relations to other courses: basics of Programming, Data Structures.

Main topics and learning objectives:

Themes	Learning objectives
Generating functions and recurrence relations	To know: analytical methods in the combinatorics, recent research in the analytical combinatorics; methods of constructing and analysis of the algorithms; theory of analysis of the algorithms; methods for algorithmic modeling of tasks. Be able: to apply the methods of constructing algorithms; to apply analytical methods in the analysis of the basic combinatorial algorithms; to apply methods of algorithmic modeling in the analysis of performance of applications. To own: basic theoretical concepts of methods of analysis of the algorithms; the basic techniques of using analytical methods in the evaluation of combinatorial complexity of algorithms
Dynamic programming	
Greedy algorithms	
Asymptotic approximation	
Algorithms on graphs	
Sorting algorithms	
Analytic combinatorics	
NP-completeness	

Assessment:

Formative: in interaction with lecturer and tutor during learning period. On site, skype, email are preferable.

Summative:

Number and Type; Connection to Course	Duration	Part of final mark in %
Pass Test	90 min	100%

Learning outcomes:

Academic: To be able to apply algorithm analysis methods.

Prerequisites for Credit Points: The credit points will be granted when the course has been successfully completed, i.e. all parts of the examination are passed.