Title:	**Algorithms and Data Structures**
Lecture hours:	30
Study period: (summer/winter)	winter or summer
Number of credits:	3
Assessment methods:	homework, tests, exam
Language of instruction:	English
Prerequisites:	familiarity with any programming language or Sage
Course content:	Abstract data structure as an organization of data with specified properties; Big oh and theta notations, average, the best and the worst case analyses; simple recurrence relations and their applications to algorithms analyses; Data structures: arrays, lists, stacks, trees; Algorithm designing techniques: divide and conquer, dynamic programming, recursion; Graphs: representation, breadth and depth first searches, shortest path, minimal spanning tree, etc.
Learning outcomes:	By the end of the course students should know: fundamental data structures, efficient algorithms for a number of fundamental problems and should be able to: use appropriate data structures, prove correctness and analyse running times of algorithms, translate algorithms into computer programs using any software tool (Python, C++, Sage). Students should also intensify cooperative work and demonstrate positive interpersonal skills.
Name of lecturer:	Dr Marcin Kowalewski
Contact (email address):	marcinko@ukw.edu.pl
Literature:	1. Mark Allen Weiss, Data Structures and Algorithm Analysis in C++, Florida International University, 2014. 2. Data Structures & Algorithms, 2016 by Tutorials Point. 3. William A. Stein et al.: Sage Mathematics Software (Version 5.2), The Sage Development Team, 2012, http://www.sagemath.org.

	4. William Stein, Sage for Power Users, 2012.