Course Descriptions None 2026-2027

Course Title	Data Structures and Algorithms
Course Code	KEN1420
ECTS Credits	5,0
Assessment	Whole/Half Grades

Period

Period	Start	End	Mon	Tue	Wed	Thu	Fri
4	1-2-2027	25-3-2027					

Level	no level
Coordinator	Tom Pepels For more information:tom.pepels@maastrichtuniversity.nl
Language of instruction	English
Goals	* Knowledge and understanding: Students are able to give examples of data structures and explain do they support program design. Students are able to name what types of standard data structures exist and illustrate their properties. Students are able to describe some standard algorithms and highlight their properties. Students are able to illustrate how to develop and analyze new algorithms. * Applying knowledge and understanding: Students are able to select the appropriate data structure for a given problem and students are able to propose an algorithm for solving a given problem * Making Judgements: Students are able to justify if and determine how data structures are applied. Furthermore, students are able to assess whether algorithms are appropriate and efficient. * Communication: Students are able to explain how data structures and algorithms are to be included in program designs. * Learning Skills: Students are able to reflect on which data structures and/or algorithms are applicable for each problem.
Description	As a continuation of the courses Computer Science 1 and 2, this course will treat the systematic design and application of data structures and algorithms. Data structures such as lists, trees, graphs, and dictionaries, the associated algorithms and their complexity are explored in this course. Algorithms for applications such as sorting, pattern matching and graph traversal are also part of the course. Furthermore, design principles for algorithms such as recursion, divide-and-conquer and dynamic programming will be treated as well. Furthermore, students will develop skills to analyse the run-time and space complexity of data structures and algorithms.
Literature	Study material: * Sedgewick and Wayne (2011) Algorithms Fourth Edition. Addison Wesley. ISBN: 978-0321573513 Additional or recommended literature: * A Y Bhargava (2016). Grokking Algorithms: An Illustrated Guide for Programmers and Other Curious People. Manning. ISBN: 978-1617292231
Prerequisites	
Keywords	
Transitional Regulations	
Teaching methods	Lecture
Assessment methods	Written Exam
Evaluation in previous academic year	For the complete evaluation of this course please click http://iwio-sbe.maastrichtuniversity.nl/rapporten.asp?referrer=codeUM
This course belongs to the following programme / specialisation	