



THE CYPRUS INTERNATIONAL INSTITUTE OF MANAGEMENT
COURSE UNIT DESCRIPTION

Course Unit Title	Algorithms and Data Structures		
Course Unit Code	AT700		
Type of Unit	Core		
Level of Course Unit	Second cycle		
Year of Study	First/second year		
Semester	On demand		
Number of ECTS Credits	6 ECTS		
Course Unit Objectives	The objective of this course is to teach students to effectively use basic data structures, such as stacks and queues, various types of lists, binary and multi-way trees, and graphs, in programs. A secondary goal is to introduce the student to the analysis of algorithms using notation such as Theta, Big- and Small-Oh, and Big- and Small-Omega.		
Learning Outcomes	On completion of this course students are expected to:		
	CILO 1	Describe types of notation for the determination of algorithm time efficiency	
	CILO 2	Calculate the running time of algorithms	
	CILO 3	Apply linear and non-linear data structures towards the solution of computational problems	
	CILO 4	Discuss the differences between the class P and the class NP of problems.	
	CILO 5	Apply various types of algorithms for the solution of computational problems	
Name of Lecturer(s)	Dr. George Christou		
Mode of delivery	Face to Face		
Prerequisites or corequisites	BI420		
Course Content	Algorithm Analysis, Recursion		CILO 1, 2
	Arrays, Linked Lists, Stacks, Queues, Trees, Priority Queues, Maps, Hash Tables, Search Trees, Graphs		CILO 3
	Efficiency of the class P, NP, and distinction of NP-Complete and NP-Hard problems.		CILO 4
	Searching and Sorting, Text Processing and Pattern Matching		CILO 5
			CILO
Recommended or required reading	<u>Textbooks:</u> Data Structures and Algorithms in Python, Goodrich, Tamasia and Goldwasser; Data Structures and Algorithms with Python, Lee and Hubbard <u>Optional textbook:</u> <u>Articles & Journals:</u> 1. O. Amble, D. E. Knuth, Ordered hash tables, The Computer Journal, Volume 17, Issue 2, 1974, Pages 135–142 2. Aragon, Cecilia & Seidel, Raimund. (1989). Randomized Search Trees. Conference: 30th Annual Symposium on Foundations of Computer Science, Research Triangle Park, North Carolina, USA, 30 October - 1 November 1989 540-545. <u>Online sources:</u>		
Planned learning activities and teaching methods	Lectures; in-class discussion and debates; in-class exercises; problem sets; team work; video case studies, team presentations, interactive online learning via Moodle (quizzes, assignments, forums)		
Assessment methods and criteria	Programming exercises, examinations, in-class exercises		
Language of Instruction	English		
Work Placement(s)	Not applicable		