

## ■ CE64 - Data Structures

### GENERAL

<b>SCHOOL</b>	EXACT SCIENCES		
<b>DEPARTMENT</b>	MATHEMATICS		
<b>LEVEL OF STUDIES</b>	UNDERGRADUATE		
<b>COURSE CODE</b>	CE64	<b>SEMESTER</b>	F
<b>COURSE TITLE</b>	DATA STRUCTURES		
<b>INDEPENDENT TEACHING ACTIVITIES</b>	<b>WEEKLY TEACHING HOURS</b>	<b>ECTS</b>	
Lectures	4	5	
<b>COURSE TYPE</b>	Skills Development		
<b>PREREQUISITE COURSES</b>	-		
<b>LANGUAGE OF TEACHING AND EXAMINATIONS</b>	Greek/English		
<b>THE COURSE IS OFFERED TO ERASMUS STUDENTS</b>	YES		
<b>COURSE WEBSITE (URL)</b>	<a href="http://eclass.uowm.gr/">http://eclass.uowm.gr/</a>		

### LEARNING OUTCOMES

<b>Learning Outcomes</b>
<p>When the student successfully completes the course he will be able to:</p> <ul style="list-style-type: none"> <li>• describe the Data Structures (D.D.) that he/she uses,</li> <li>• assess the possibilities (advantages-limitations) of a specific D.D.,</li> <li>• examine the respective problem in relation to the available D.D.,</li> <li>• plan the appropriate D.D. in each case,</li> <li>• create-implement the selected D.D. in C programming language,</li> <li>• compare and evaluate the performance of D.D.</li> </ul>
<b>General Competencies</b>

- Search, analysis and synthesis of data and information, using the necessary technologies.
- Adapting to new situations.
- Making decisions.
- Independent work.
- Team work.
- Criticism and self-criticism.
- Promotion of free, creative and inductive thinking.

### CONTENT OF THE COURSE

Introduction to Data Structures Necessity-Usefulness.

- The table structure. Evaluation of the array structure.
- The structure of the Stack (Static and dynamic).
- The structure of the Queue (Static and dynamic).
- The structure of the Priority List and Queue.
- The Linked List structure single & double.
- The structure of the Tree. Binary Search Tree.
- The structure of the red-black Tree. 2-3-4 Tree.
- The structure of the Hash Table.
- The Heap structure.
- The structure of the Scripture.
- The classification algorithms.

Recap and compare structures.

### TEACHING AND LEARNING METHODS - EVALUATION

<b>TEACHING METHOD</b>	In the classroom and lab.	
<b>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY</b>	Learning process support through the Moodle electronic platform. Laboratory training.	
<b>TEACHING ORGANIZATION</b>	<b>Activity</b>	<b>Semester Workload</b>
	Lectures	39 hours
	Individual Study	60 hours
	Laboratory Exercise	26 hours
	Course Total (25 hours per ECTS)	125 hours

<b>STUDENT EVALUATION</b>	<p>For the successful examination of the course, the student must be successfully examined independently in both parts of the course, theory and laboratory.</p> <p>The evaluation in the theoretical part results from:</p> <ol style="list-style-type: none"> <li>1. 35% the performance in individual assignments-online tests with multiple choice questions through the course page will be graded,</li> <li>2. 65% of the final exams of the course with a comparative evaluation of theory elements.</li> </ol> <p>The assessment in the laboratory part results in:</p> <ol style="list-style-type: none"> <li>1. active participation during the student's presence and work in the laboratory by 30%,</li> <li>2. his/her final exam by 70%.</li> </ol> <p>The overall grade of the course is the weighted average of 60% the grade of the theoretical part and 40% of the laboratory.</p>
---------------------------	--

#### **RECOMMENDED BIBLIOGRAPHY**

1. Data Structures & Algorithms in Java, Lafore Robert EDITIONS CH. GKIOURDA & Co EE. (Greek)
2. Data structures, algorithms and C++ applications, Sahnii Sartaj PUBLICATIONS A. TZIOLA & SONS S.A. (Greek)
3. DATA STRUCTURES, GEORGAKOPOULOS G.F. TECHNOLOGY & RESEARCH INSTITUTE PUBLICATIONS - UNIVERSITY PUBLICATIONS OF CRETE. (Greek)
4. Data structures & file organizations Ch. Koilias Publications of New Technologies. (Greek)
5. Data structures, Bozanis Panagiotis D. EDITIONS A. TZIOLA & SONS S.A. (Greek)