COURSE OUTLINE

1. GENERAL

SCHOOL:	Engineering		
ACADEMIC UNIT:	Industrial Design and Production Engineering		
LEVEL OF STUDIES:	Undergraduate		
COURSE CODE:	**2003**	**SEMESTER**	**2**
COURSE TITLE:	Algorithms and Data Structures		
INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**ECTS CREDITS**
Theory (Lectures)		3	3
Laboratory		1	2
		4	**5**
COURSE TYPE:	General knowledge		
PREREQUISITES COURSES:	No		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes		
COURSE WEBSITE (URL)	https://eclass.uniwa.gr/courses/IDPE111/		

2. LEARNING OUTCOMES

Learning Outcomes
Upon completion of the course students will have: 1. Familiarity with the concepts of algorithms 2. Algorithm analysis skills 3. Knowledge of basic and secondary data structures In detail, students will be able to: 1. Analyze and design algorithms. 2. Implement data structures in C ++ 3. Select the appropriate data structures for each algorithm 4. Implement the basic algorithms in C ++
General Competences
1. Search, analysis and synthesis of data and information, using the necessary technologies 2. Adaptation to new situations 3. Decision making 4. Production of new research ideas 5. 5. Promoting free, creative and inductive thinking

3. SYLLABUS

The course Algorithms and Data Structures deals with the basic concepts of algorithms and data structures.
Algorithms:

- Brute Force
- Divide and Conquer
- Greedy Algorithm
- Algorithm analysis

Data structures:

- Tables, Lists, Stacks, Queues,
- Static-Dynamic Trees
- Binary Trees

4. TEACHING and LEARNING METHODS – EVALUATION

<table>
<tr><td>DELIVERY</td><td>In-class face-to-face
• Lectures
• Practice exercises
• Laboratories
• Assignments & Presentations</td></tr>
<tr><td>USE OF INFORMATION AND COMMUNICATION TECHNOLOGY</td><td>• Use of ICTs in theoretical teaching and use of ICTs in lecturing
• Use of ICTs in laboratory-based training
• Use of ICTs for the communication with students via the e-class platform
• Specialised software tools for experimentation
• Support of the educational process via the e-class platform</td></tr>
<tr><td>TEACHING METHODS</td><td><table><tr><th>Method description / Activity</th><th>Semester Workload</th></tr><tr><td>Lectures</td><td>39</td></tr><tr><td>Laboratory work</td><td>36</td></tr><tr><td>Non-guided personal study</td><td>75</td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td>Course Total (30h/ECTS)</td><td>150</td></tr></table></td></tr>
<tr><td>STUDENT PERFORMANCE EVALUATION</td><td>Language of Assessment
Greek
Description
Written exams, laboratory evaluation and project evaluation
Student assessment methods</td></tr>
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	• Written examination with short answer questions (Concluding) • Written exams with multiple choice questions (Concluding) • Written assignment (Formative) • Laboratory/project work (Formative) The final grade of the course consists of: • Final written examination in the entire theoretical content (80%), • Elaboration of laboratory-based work (20%). The assessment criteria are announced to students at the beginning of the semester and are published on the course webpage in the e-Class platform.

5. ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

- *Algorithms, Edmonds Jeff, Publications: Kritiki*
- *Quantitative Methods and Applications, Ch.Fountas, Ch.Drosos, Publications: Varvarigou*
- *C: From Theory to Application, Tselikis, Tselikas, Publications: G.Tselikis*
- *Introduction to Algorithm Analysis and Design, AnanyLevitin, Jiola Publications*
- *Introduction to Object-Oriented Programming, Sgouropoulou, Troussas,*