ΜΟΝΑΔΑ ΔΙΑΣΦΑΛΙΣΗΣ ΠΟΙΟΤΗΤΑΣ Α.Π.Θ.

Materials Informatics

1. GENERAL			
SCHOOL	Faculty of Sciences in collaboration with Faculty of Engineering, Aristotle University of Thessaloniki		
DEPARTMENT	Materials Science and Engineering		
LEVEL OF STUDIES	ISCED level 7 (5-year Integrated Master's programme) ISCED level 6 (4-year BSc programme)		
COURSE CODE	**MSEN 105**	**SEMESTER**	1st Semester
COURSE TITLE	**Materials Informatics**		
TEACHING ACTIVITIES Lectures, tutorials/problem sessions, laboratory/computer exercises (where applicable), case studies and guided self-study.		**TEACHING HOURS PER WEEK**	**ECTS CREDITS**
		4 (3L + 1T)	6
COURSE TYPE	Mandatory / Scientific area / Skills development		
PREREQUISITES	No prerequisities		
TEACHING AND EXAMINATION METHODS	Face-to-face lectures and guided problem-solving sessions; short in-class quizzes; final written examination.		
COURSE OFFERED TO ERASMUS STUDENTS	Yes		
COURSE URL	https://elearning.auth.gr/course/view.php?id=xxxxx		

2. LEARNING OUTCOMES	
Learning Outcomes	By the end of this course, students will be able to: • Analyze a problem and design a solution (algorithm formulation). • Develop structured, efficient, comprehensible, and reusable computer programs that solve specific problems or families of problems. • Understand complex programs. • Evaluate the efficiency of the solution (algorithm). • Analyze data and create basic simulations.
General Skills	• Search for, analysis and synthesis of data and information, with the use of the necessary technology • Work autonomously • Advance free, creative and causative thinking • Adapting to new situations • Decision-making • Modeling and solving real-world problems • Working in a multidisciplinary environment

3. COURSE CONTENT
The Material Informatics course aims to cultivate computational problem-solving skills. Upon completion of the course, students should be able to use a computer for problem-solving, as well as for data analysis and the creation of basic simulations. More specifically, they should be able to theoretically analyze a problem, formulate a solution algorithm, and solve it practically by developing an appropriate computer program, adhering to fundamental programming principles. The final grade is determined by examinations as well as the evaluation of assignments and projects. The course utilizes the MATLAB computational environment and programming language, while also including elements of Python.

4. LEARNING & TEACHING METHODS - EVALUATION	
Teaching method	Face-to-face.
Use of ICT	Use of ICT in Course Teaching, Use of ICT in Communication with Students Description: Use of Information and Communication Technologies (ICT) in teaching the course with tools of modern distance learning (MS-Teams) and asynchronous education (e-learning). Use of learning aids based on ICT: Excel, Matlab, Python Use of ICT in student assessment: Electronic grading (e-learning). Use of ICT in communication with students: e-leaning, email, MS-Teams.
Teaching organization	The supervised and unsupervised workload per activity is indicated below (total workload complies with ECTS standards).

Activity	Workload/semester (hours)
Lectures	40
Laboratory Work	12
Project	80
Exams	2
Total	**150**

Student evaluation	Assessment language: English. Written Exams with Problem Solving with Short Answer / Written Exams with Problem Solving (Summative) / Oral Exams / Staging Laboratory Assignment

5. SUGGESTED BIBLIOGRAPHY
EUDOXUS
1. Steven I. Gordon, Brian Guilfoos. (2017). Introduction to Modeling and Simulation with MATLAB and Python, Taylor and Francis Group. 2. Stormy Attaway. (2017). MATLAB, A Practical Introduction to Programming and Problem Solving, Elsevier
Additional bibliography for study
• Teaching material slides