

COURSE OUTLINE

(1) GENERAL

SCHOOL	School of Engineering		
ACADEMIC UNIT	Department of Naval Architecture		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	NAOME1229	SEMESTER	5 th
COURSE TITLE	INTRODUCTION TO CONTROL SYSTEMS		
INDEPENDENT TEACHING ACTIVITIES		WEEKLY TEACHING HOURS	CREDITS (ECTS)
Lectures		2	4
Laboratory		2	
Total		4	
COURSE TYPE <i>general background, specialbackground, specialised general knowledge, skills development</i>	Special background		
PREREQUISITE COURSES:	Fundamentals of Electrical engineering (NAOME1221)		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes		
COURSE WEBSITE (URL)	https://eclass.uniwa.gr/courses/NA222/		

(2) COURSE GOALS / LEARNING OUTCOMES

The main objective of the course is to introduce students to the fundamental principles of basic control theory (i.e. open/closed loop systems, Laplace transform, Transfer functions of typical 1st and 2nd order systems, steady state error, stability, Routh's stability criterion, time response, frequency response, P, PI, PID controllers, etc), Programmable Logic Controllers (principle of operation, LADDER language) and characteristic ship automation systems.

(3) COURSE CONTENT / SYLLABUS

- Fundamental principles of control theory (basic types of automation systems, block diagrams, open/closed loop systems, Laplace transform, transfer function, steady state error, stability, Routh's stability criterion, time response, frequency response, Bode diagrams)
- Controllers employed on a typical control system (two-step, P, PI, PID)
- Principles and applications of Programmable Logic Controllers (PLC)
- LADDER programming language
- Typical ship automation systems

Laboratory: Apart from the 2h weekly instructions, the specific module incorporates also a laboratory part where students have the opportunity to perceive practically the key principles introduced at lectures, by performing appropriate "hands-on" exercises.

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY Face-to-face, Distance learning, etc.	Face-to-face														
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY Use of ICT in teaching, laboratory education, communication with students	<ul style="list-style-type: none">• Use of ICT in teaching• Use of specialized Laboratory equipment• Asynchronous e-learning support through “Open eClass” platform														
TEACHING METHODS <i>The manner and methods of teaching are described in detail.</i> <i>Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.</i> <i>The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS</i>	<table border="1"><thead><tr><th>Activity</th><th>Workload (hours)</th></tr></thead><tbody><tr><td>Lectures</td><td>26</td></tr><tr><td>Laboratory exercises – Laboratory technical reports</td><td>26</td></tr><tr><td>Study of Lectures</td><td>65</td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td>Course total</td><td>117</td></tr></tbody></table>	Activity	Workload (hours)	Lectures	26	Laboratory exercises – Laboratory technical reports	26	Study of Lectures	65					Course total	117
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STUDENT PERFORMANCE EVALUATION <i>Description of the evaluation procedure</i> <i>Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other</i>	Lectures: Final written examination (75%) Laboratory: - Written examination (20%) - Laboratory technical reports (5%)														

(5) ATTACHED BIBLIOGRAPHY

<ol style="list-style-type: none">1. Συστήματα αυτόματου ελέγχου, Α.Ν. Βελώνη, Δ.Κ. Κανδρή, εκδόσεις Τζιόλα, 20172. Συστήματα αυτόματου ελέγχου, Π.Β. Μαλατέστας, εκδόσεις Τζιόλα, 20173. Προγραμματιζόμενοι Λογικοί Ελεγκτές, F. Petruzella, εκδόσεις Τζιόλα, 20184. Εισαγωγή στον αυτόματο έλεγχο – Θεωρία και εφαρμογές, Ν.Ι. Κρικελής, εκδόσεις Συμμετρία, 20005. Modern control systems, R. C. Dorf, R.H. Bishop, Prentice Hall, 20106. Control systems engineering, N.S. Nise, Wiley, 20117. Journal of Marine Science and Application, ISSN: 1671-94338. Journal of Marine Science and Technology, ISSN: 0948-42809. Transactions of the Society of Naval Architects and Marine Engineers [S.N.A.M.E.], ISSN: 0081-16110. SAE Technical papers, ISSN: 0148-7191
