COURSE OUTLINE

1. GENERAL

SCHOOL	ENGINEERING		
DEPARTMENT	PRODUCT AND SYSTEMS DESIGN ENGINEERING		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	**5305**	**SEMESTER**	**8**
COURSE TITLE	**Special Topics in Mechatronics**		

INDEPENDENT TEACHING ACTIVITIES *if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits*	**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures	**3**	**6**
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).		

COURSE TYPE *general background, special background, specialised general knowledge, skills development*	Special background, skills development
PREREQUISITE COURSES:	NONE
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK/ENGLISH
COURSE DELIVERED TO ERASMUS STUDENTS	YES
MODULE WEB PAGE (URL)	https://eclass.uowm.gr/

2. LEARNING OUTCOMES

Learning outcomes

On successful completion of this module the learner will be able to:

The students are able to:

- model electromechanical systems
- understand micro-electromechanical systems and their applications
- design PID controllers and control systems based on microprocessors and microcontrollers
- understand DSP processors, digital filters and their applications

General Skills

Upon successful completion of the program students will:

- have the theoretical and practical background on the field of product and systems design engineering and the corresponding profession.
- utilize scientific knowledge to understand, analyze and solve problems.
- apply a wide range of scientific and technical knowledge concerning the design and development of products and systems.

3. COURSE CONTENTS

Energy conversion between electrical and mechanical mechanisms. Micro-electromechanical systems (MEMs): micro-sensors, micro-motors, nano-machines. Modern models of linear automatic control systems based on state equations. Design of feedback controllers using state space models. PID controllers. Control systems based on microprocessors and microcontrollers. Digital filters. Digital signal processors (DSP).

4. TEACHING METHODS - ASSESSMENT

<table>
<tr><td>MODE OFDELIVERY</td><td>In class, face to face</td></tr>
<tr><td>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY</td><td>• Video and slide presentations via projector
• Support of teaching process via the electronic platform e-class
• Communication with students.</td></tr>
<tr><td>TEACHING METHODS</td><td>
<table>
<tr><th>Activity</th><th>Semester workload</th></tr>
<tr><td>Lectures</td><td>90</td></tr>
<tr><td>Non-directed study</td><td>60</td></tr>
<tr><td></td><td></td></tr>
<tr><td></td><td></td></tr>
<tr><td>Course total</td><td>150</td></tr>
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<tr><td>ASSESSMENT METHODS</td><td>Final written exam which includes:
i. Short-answer questions
ii. Multiple choice questions
iii. Problem solving

Assignment</td></tr>
</table>

5. ATTACHED

- Suggested bibliography:

1. Βιβλίο [50661508] Μηχατρονική, Ηλεκτρονικά Συστήματα Ελέγχου για Επιστήμονες και Μηχανικούς, 6η Έκδοση, Bolton William Λεπτομέρειες
2. Βιβλίο [68401264]: Εισαγωγή στη Μηχατρονική και στα ενσωματωμένα συστήματα, Αλατσαθιανός Σταμάτης Λεπτομέρειες
3. Βιβλίο [18548929]: Μηχατρονική, Nesculescu Dan Λεπτομέρειες