COURSE OUTLINE

1. GENERAL

SCHOOL	ENGINEERING		
DEPARTMENT	PRODUCT AND SYSTEMS DESIGN ENGINEERING		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	**4308**	**SEMESTER**	**9**
COURSE TITLE	**Motion Design and Autonomous Moving Units**		

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:

- understand the basic principles of Autonomous Unit Motion Design.
- understand the functions and ways of controlling an autonomous system.
- solve problems related to the motion design of robotic manipulators and robotic vehicles by using analytical mathematical tools.

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

- Factory cargo transport (robotic transport systems and loading-unloading systems).
- Robot motion design methods (cell decomposition, artificial potential fields, roadmaps).
- Solving motion problems of robotic manipulators and robotic vehicles (kinematics, constraints, workspace, configuration space, obstacles).
- Interaction of robotic systems with humans and the environment.
- Task scheduling.

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>
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<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 [13936]: Υπολογιστική Γεωμετρία: Μια σύγχρονη Αλγοριθμική Προσέγγιση, Γιάννης Ζ. Εμίρης Λεπτομέρειες
2. Βιβλίο [102070469]: Τεχνητή Νοημοσύνη: Μια σύγχρονη προσέγγιση, Stuart Russel, Peter Norvig Λεπτομέρειες