COURSE OUTLINE

1. GENERAL

SCHOOL	ENGINEERING		
DEPARTMENT	PRODUCT AND SYSTEMS DESIGN ENGINEERING		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	**4207**	**SEMESTER**	**8**
COURSE TITLE	**K2 - Special Topics in Design and Manufacturing Simulation**		

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 cutting and micro-cutting mechanisms.
- calculate specific cutting parameters (power, cutting forces, tool wear) in standard cutting processes.
- understand the techniques of measuring roughness and cutting forces.
- understand the basic parameters governing simulation models of cutting processes with the aid of finite elements (FEM).
- implement models for predicting cutting forces and roughness.

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

- Kinematics, mechanisms, tools and cutting conditions of standard machining operations with material removal (turning, drilling, milling).
- Machine tools (types, structure).

- Micro-cutting (mechanism, types, tools).
- Wear of cutting tools and tool life.
- Measurement of surface roughness and cutting forces by experimental methods (profilometer, dynamometer).
- Analytical and numerical methods of simulation of cutting processes.
- Finite element method (FEM) in cutting processes.
- Simulation through linear regression and neural networks.

4. TEACHING METHODS - ASSESSMENT

MODE OFDELIVERY	In class, face to face
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY	• Video and slide presentations via projector • Support of teaching process via the electronic platform e-class • Communication with students.
TEACHING METHODS	

Activity	***Semester workload***
Lectures	90
Non-directed study	60
Course total	**150**

ASSESSMENT METHODS	Final written exam which includes: i. Short-answer questions ii. Multiple choice questions iii. Problem solving Assignment

5. ATTACHED

- Suggested bibliography:

1. Βιβλίο [68394938]: Μηχανουργική Τεχνολογία, 3η έκδοση, Αριστομένης Αντωνιάδης Λεπτομέρειες
2. Βιβλίο [68374003]: Μηχανουργική Επιστήμη και Τεχνολογία, 7η έκδοση, Kalpakjian Serope, Schmid Steven Λεπτομέρειες