COURSE OUTLINE

(1) GENERAL

SCHOOL	School of Engineering		
ACADEMIC UNIT	Department of Naval Architecture		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	NAOME1104	**SEMESTER**	1st
COURSE TITLE	**MECHANICAL ENGINEERING DRAWING & INTRODUCTION TO MCAD**		

INDEPENDENT TEACHING ACTIVITIES	**WEEKLY TEACHING HOURS**	**CREDITS (ECTS)**
Lectures	2	4
Laboratory	2	
Total	4	

COURSE TYPE *general background, specialbackground, specialised general knowledge, skills development*	General background
PREREQUISITE COURSES:	
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes
COURSE WEBSITE (URL)	https://eclass.uniwa.gr/courses/NAFP162/

(2) COURSE GOALS / LEARNING OUTCOMES

The aim of the course is to familiarize the students with the basic theory and principles of mechanical design and the production of accurate and detailed 2D mechanical drawings of two-dimensional and three-dimensional objects. Also, main objective of the course is to learn the use of Computer-Aided Design (CAD) software for the design of 3D mechanical parts.

Upon successful completion of the course, the student will be able:

- To have the theoretical and practical background concerning the field of Mechanical Design.
- To correctly identify and describe the mechanical drawings of objects, tools, components, machines, etc.
- To create mechanical drawings of two-dimensional and three-dimensional geometric entities, describing with clarity objects - machine elements - products.
- To have a complete understanding and use of the rules of technical design and standardization of components (DIN, ISO, ANSI, ELOT, etc.).
- To evaluate existing mechanical drawings, to judge their correctness and to make the necessary corrections and modifications.
- To apply the rules of dimensioning in dimensions, tolerances, surface quality, joints, welding symbols, etc.
- 7. To be capable to develop and analyze 3D objects and 2D drawings with the help of Computer (Computer Aided Design).

(3) COURSE CONTENT / SYLLABUS

Lectures:

- Introduction to the Mechanical Drawing. Categories of Mechanical Drawing. International standards and design regulations.
- Paper size. Drawing tools. Scales. Line types and sketching. Title blocks.
- Projection theory. Orthographic projections. Arrangement of drawing views. Auxiliary views. Isometric drawing. Axonometric drawing.
- Sectional views. Types of section. Revolves and removed sections. Partial sections.
- Dimensioning. Rules. Symbols. Construction drawings.
- Threaded fasteners. Threaded holes. Threaded assemblies. Standards. Bolts. Nuts.
- Dimensional tolerances. Geometric tolerances. Feature control frame. Tolerance grades. Limits and fits. Hole and shaft categories. Surface roughness.
- Design of machine elements: wedges, keys, washers, seals, pin fasteners, welds, springs, spur gears, bearings.
- Introduction to assembly drawings. Bill of materials. Disassembly of mechanical products.
- Introduction to Mechanical Computer Aided Design (MCAD). 3D modeling and design. Representation of geometric entities. Edge models. Surface models. Solid models.
- CAD / CAM software. Modeling. Visualization. Simulation. Optimization.

Laboratory: Laboratory exercises on rough drawings of mechanical parts, detailed drawings on sheet (orthographic projections, isometric drawing, sectional drawing, assembly drawing), two-dimensional and three-dimensional computer-aided design using software such as Autodesk AutoCAD & Autodesk Inventor.

(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	• Use of ICT in teaching. • Use of specialized CAD software. • Support learning through the electronic e-class platform.
TEACHING METHODS *The manner and methods of teaching are described in detail.* *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.* *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*	
STUDENT PERFORMANCE EVALUATION *Description of the evaluation procedure 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*	Lectures: Written examination (50%) Laboratory (50%) : - Final examination on drawing. - Laboratory drawing exercises.

Activity	*Workload (hours)*
Lectures	26
Laboratory drawing exercises	26
Homework assignments	39
Study of Lectures	26
Course total	***117***

(5) ATTACHED BIBLIOGRAPHY

1. Interpreting Engineering Drawings, Theodore Branoff, Cengage Learning, 2016, ISBN: 1133693598.
2. Beginning AutoCAD 2019 Exercise Workbook Kindle Edition, Cheryl R. Shrock and Steve Heather, 2018, Publisher: Industrial Press, Inc., ASIN: B07CVNZ997.