COURSE OUTLINE

(1) GENERAL

SCHOOL	School of Engineering		
ACADEMIC UNIT	Department of Naval Architecture		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	NAOME1356	**SEMESTER**	9th
COURSE TITLE	**3D COMPUTER AIDED DESIGN**		

INDEPENDENT TEACHING ACTIVITIES	**WEEKLY TEACHING HOURS**	**CREDITS (ECTS)**
Lectures	3	4

COURSE TYPE *general background, specialbackground, specialised general knowledge, skills development*	Specialized
PREREQUISITE COURSES:	NAOME1104 - MECHANICAL ENGINEERING DRAWING AND INTRODUCTION TO MCAD and NAOME1215 - MACHINE ELEMENTS
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes
COURSE WEBSITE (URL)	https://eclass.uniwa.gr/courses/NA224/

(2) COURSE GOALS / LEARNING OUTCOMES

3D Computer Aided Design refers mainly to the 3D modeling of products (mechanical, shipbuilding, industrial, etc.), but also comprises an important tool that integrates functions relative to product development as simulation analysis and manufacturing processing (CAE/CAM). In this course, students will learn in-depth the principles and strategies for efficient design of complex products and structures, the methodology of feature-based parametric design, the basic modeling techniques used in CAD systems, and they will practice in the use of software such as Fusion360 and SolidWorks. In the end of the course the students will have acquired cutting edge knowledge to design problems related to their subject matter and at the same time they will be able to develop new and innovative ideas and products.

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

- To choose the optimal methodology of parametric design of a product depending on the application to be used (study, technical analysis, manufacturing, fabrication, etc.).
- To develop with precision and with the required technological information models of mechanical, shipbuilding and industrial components according to the requirements of the industry.
- To analyze an assembly into components and to distinguish their geometric and topological characteristics.
- To recognize the structure of a complex product / construction and compose the design steps for its 3D modeling.
- To evaluate existing drawings of 3D components and assemblies and make the desired

or necessary modifications and upgrades.

- To recognize the capabilities and functions of CAD systems and evaluate existing commercial software and modeling techniques.

(3) COURSE CONTENT / SYLLABUS

- General principles of 3D design. The use of computers in the product development cycle (CAD/CAE/RP/CAM/CAPP).
- Representation of geometric entities in CAD systems (edge models, surface models, solid models).
- Basic techniques for modeling solid models (Constructive solid geometry, Boundary representation).
- Parametric feature-based modeling.
- CAD software categories, capabilities, and functions. Graphic interface environment.
- 3D design of parts and assemblies and modifications.
- 3D modeling for CAE processing (thermal stress analysis with FEA).
- 3D modeling for CAM processing.
- 3D modeling for additive manufacturing (3D printing).
- 3D sheet metal modeling.
- 3D modeling from a point cloud.
- 3D mechanism modeling, kinematic analysis and simulation.

(4) TEACHING and LEARNING METHODS - EVALUATION

<table>
<tr><td>DELIVERY
Face-to-face, Distance learning, etc.</td><td>Face-to-face</td></tr>
<tr><td>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY
Use of ICT in teaching, laboratory education, communication with students</td><td>• Use of ICT in teaching.
• Use of specialized CAD/CAE/CAM software.
• Support learning through the electronic e-class platform.</td></tr>
<tr><td>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</td><td>
<table>
<tr><th>Activity</th><th>Workload (hours)</th></tr>
<tr><td>Lectures</td><td>27</td></tr>
<tr><td>3D CAD practice exercises</td><td>35</td></tr>
<tr><td>Assignments - projects</td><td>20</td></tr>
<tr><td>Study of Lectures</td><td>35</td></tr>
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<tr><td>Course total</td><td>117</td></tr>
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</td></tr>
<tr><td>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</td><td>i) Written final examination (60%).
ii) Evaluation of project reports (40%).</td></tr>
</table>

(5) ATTACHED BIBLIOGRAPHY

1. Μηχανολογικός Σχεδιασμός (Mechanical Design), Schellman B., Stephan A., Fischer U., Lohr A., 1η/2017, Εκδότης: ΜΑΡΙΑ ΠΑΡΙΚΟΥ & ΣΙΑ ΕΠΕ (ΙΩΝ), ISBN: 9605082215. Κωδικός Βιβλίου στον Εύδοξο: 59382740.
2. Τεχνικό Σχέδιο και Γραφικά με το SolidWorks, James D. Bethune, 1η/2018, Εκδόσεις ΓΡΗΓΟΡΙΟΣ ΧΡΥΣΟΣΤΟΜΟΥ ΦΟΥΝΤΑΣ, ISBN: 9789603307785. Κωδικός Βιβλίου στον Εύδοξο: 68375429.
3. Solid Modeling and Applications. Rapid Prototyping, CAD and CAE Theory, Dugan Um, 2016, Springer, ISBN 9783319218229. Κωδικός Βιβλίου στον Εύδοξο: 75492729.
4. e-Design: Computer-Aided Engineering Design, 1st Edition, Kuang-Hua Chang, 2015, Elsevier, ISBN: 9780123820389.