

3.6 CE0360 – CAD Methods in Technical Works

(1) GENERAL

SCHOOL	ENGINEERING SCHOOL		
ACADEMIC UNIT	CIVIL ENGINEERING DEPARTMENT		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	CE-360	SEMESTER	9
COURSE TITLE	CAD Methods in Technical Works		
INDEPENDENT TEACHING ACTIVITIES <i>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</i>	WEEKLY TEACHING HOURS	CREDITS	
	3	3	
<i>Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).</i>			
COURSE TYPE <i>general background, special background, specialised general knowledge, skills development</i>	Special Background Course (για μαθήματα Ειδικού Υποβάθρου)		
PREREQUISITE COURSES:			
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS			
COURSE WEBSITE (URL)	https://eclass.uniwa.gr/courses/CIV360/		

(2) LEARNING OUTCOMES

<p>Learning outcomes The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.</p> <p>Consult Appendix A</p> <ul style="list-style-type: none"> • Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area • Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B • Guidelines for writing Learning Outcomes
<p>The aim of the course is to give the students fundamental concepts of CAD software principals</p> <p>The course is consists of two parts.</p> <p>The first part presents the structure and operation of the design software so that the student acquires a design mentality using CAD softwares. In this way, firstly the student can become familiar with any design program and creative skills can be developed. Moreover the spatial perception and consequently the spatial intelligence of the students is sharpened.</p> <p>AutoCAD is used as a "model" software for the educational process on the one hand because it is a "free" geometric program where the user can create any shape of two or three dimensions without restrictions, on the other hand because it is the most common program in the labor market.</p> <p>Students at the end of the course should be able to</p>

- design a technical project, configure the software by creating standards and/or intervening in its existing standards in order to speed up the production process
- be familiar with standardizations and standards as well as design methods required in team work.

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?;

Search for, analysis and synthesis of data and information, with the use of the necessary technology

Adapting to new situations

Decision-making

Working independently

Team work

Working in an international environment

Working in an interdisciplinary environment

Production of new research ideas

Project planning and management

Respect for difference and multiculturalism

Respect for the natural environment

Showing social, professional and ethical responsibility and sensitivity to gender issues

Criticism and self-criticism

Production of free, creative and inductive thinking

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Others...

The course aims at the following general skills:

- Search, analysis and synthesis of data and information, using the necessary technologies
- Promotion of official - creative and inductive thinking
- Autonomous project creation and teamwork

(3) SYLLABUS

It is emphasized that the theoretical part of the course requires a computer so that the "interface" of the student with the concepts-procedures that the teacher describes is direct.

Introduction to the PC environment For the purpose of understanding CAD software

Description of electronic design software, explanation of concepts related to electronic design.

Introduction To software.

Basic commands: Create desktop, enter coordinates, Draw lines.

1) 2d drawing

Drawing tools and control display on the screen, drawing simple objects such as straight sections, circles, arcs, points, polygrams, construction lines and generally design "entities" that touch the object.

Design methods and organization of work:

Methods of creating libraries which on the one hand minimize the time of preparation of a plan, on the other hand add to the quality of the final result.

Creation of design layers and their usefulness in design through CAD programs.

Text input, dimension drawing and delineation: Text formatting, dimensioning type creation as well as dimension design.

Prints: Print configuration, scale concept.

Creating single design entities, entities In properties, inserting entities and independent files into the design, external references.

Template files, editing individual program files (for example creating line type, line type, etc.)

Laboratory Part Description (curriculum):

In this part (which takes place in a common place and time with the theoretical) the design topics of the exercises follow the delivered material in each lesson are processed by the students and completed within the laboratory under the constant supervision and guidance of the teaching staff, and include: repetition of procedures and instructions of the previous topics.

Specifically, the student at the end of the course is capable

To draw in two dimensions (floor plans - faces - sections) (straight sections, application of Cartesian-polar coordinates, arcs, circles, ellipses, complex lines, hatches, etc.).

To create topographic diagrams by implementing using polar coordinates measurements from a speedometer-geodetic station, drawing text where required and shaping a corresponding text style.

To create and insert in a design library objects (frames, nameplates, etc.) as well as to process already designed objects by rotating them creating images etc (rotate, mirror, move, copy).

Create layers to define and manipulate their properties as well as sort objects in them, edit the program line file and create new line types, apply line breaks either selected by the program or create new line types.

To dimension his design by placing dimensions depending on the printing scale but also independently of the printing scale.

To define an observer's point of view and to design spatial models.

To process the axle system in order to design each time at the desired - required design level.

To design surfaces either autonomously or with automation using individual cross sections to create a three-dimensional terrain for example. (3dfase, rulesurf, revsurf, tabsurf, edgesurf).

Introduce and use external references and automation (xref, dwgref, attributes)

To calculate and design (equal sloped) roofs in 3d space, accurately and defining the exact position of each point of the roof in the Cartesian system of axes (x, y, z).

To print his drawings on a scale either from the model space making the necessary adjustments (colors, line thickness, printing scale, plates, etc.) or from the paper space by placing on paper that he defines views of his three-dimensional model even at different scales each.

Use new - different design environments (ArciCAD, Sketchup etc).

Index:

LINE, POLYLINE, ZOOM, ERASE, OFFSET, TRIM, EXTEND, FILLET, MIRROR, ROTATE, MOVE, COPY, DTEXT, TEXT, TEXT STYLE, DIM, DIM STYLE, LAYERS, BLOCK, WBLOCK, ATTRIBUTES, INSERT MENU (BLOCK, IMAGE), MODIFY MENU, XREF, DWG REF, 3DFACE, REVSURF, TABSURF, RULESURF, EDGESURF, UCS, HATCH, COORDINATE SYSTEMS (CARTESIAN, POLAR, SPHERICAL, CYLINDRICAL etc), 3D VIEWS, VIEWPOINT PRESETS, SHADEMODE, LINETYPE, LINEWIDTH, LINETYPE SCALE, TRANSPARENCY, OPACITY, PLOT, LAYOUT, MVIEW, MS.

(4) TEACHING and LEARNING METHODS - EVALUATION

<p style="text-align: center;">DELIVERY <i>Face-to-face, Distance learning, etc.</i></p>	<p>The method that has been chosen during the teaching is the dialectical structuralism with elements of obstetrics where the student with the -gradually decreasing- help of the teacher locates the knowledge.</p> <p>This teaching method gives, among other things, confidence to the learner through the successful application of the concepts and leads him to further search for information in order to constantly evolve.</p> <p>Teaching from a blackboard in the room (Face to face) with parallel application on a computer and immediate possibility of self-evaluation</p>														
<p style="text-align: center;">USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY <i>Use of ICT in teaching, laboratory education, communication with students</i></p>	<p>The nature of the course requires specialized software and its use.</p> <p>Multimedia material (Videos, Slides, Exercises) available On-Line from the Open Academic Courses platform.</p> <p>Additional communication via e-mail, exclusive website of the course, support of the learning process by providing selected additional exercises and indicatively solved examples through the website.</p>														
<p style="text-align: center;">TEACHING METHODS</p> <p><i>The manner and methods of teaching are described in detail.</i></p> <p><i>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.</i></p> <p><i>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</i></p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;"><i>Activity</i></th> <th style="text-align: center;"><i>Semester workload</i></th> </tr> </thead> <tbody> <tr> <td>Lectures</td> <td style="text-align: center;">-</td> </tr> <tr> <td>Classwork</td> <td style="text-align: center;">40</td> </tr> <tr> <td>Preparation for Project</td> <td style="text-align: center;">80</td> </tr> <tr> <td>Personal Study</td> <td style="text-align: center;">40</td> </tr> <tr> <td> </td> <td> </td> </tr> <tr> <td>Course total</td> <td style="text-align: center;">160</td> </tr> </tbody> </table>	<i>Activity</i>	<i>Semester workload</i>	Lectures	-	Classwork	40	Preparation for Project	80	Personal Study	40			Course total	160
<i>Activity</i>	<i>Semester workload</i>														
Lectures	-														
Classwork	40														
Preparation for Project	80														
Personal Study	40														
Course total	160														
<p style="text-align: center;">STUDENT PERFORMANCE EVALUATION <i>Description of the evaluation procedure</i></p>	<p>Laboratory:</p>														

<p><i>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</i></p> <p><i>Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</i></p>	<ul style="list-style-type: none"> • Exercise preparation (40%) • Written Final Examination in the laboratory (60%) <p>The evaluation criteria have been presented to the students before the examination, the individual grade of the subjects is written in them and the final grade is accessible through the online platform of the Institution. In addition, students can view their file and individual grade on the topics, be given clarifications about them and, finally, point out any mistakes they make.</p> <p>The language of assessment is Greek unless the students come from the Erasmus program, in which case the examination is in English.</p>
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(5) ATTACHED BIBLIOGRAPHY

<p><u>Greek Bibliography:</u></p> <ol style="list-style-type: none"> 1. McFarland, Jon. AutoCAD 2009 και AutoCAD LT 2009 : Βήμα προς βήμα / Jon McFarland · translated by Agamemnon Milios. - Athens: Gioyrdas M., 2009 2. Onstott, Scott. AutoCAD 2012 : Optical guide / Scott Onstott · translated by Agamemnon Milios. - Athens: Gioyrdas M., 2011 3. Drawing with AutoCAD 2017 / John Kapos. - Athens : Klidarithmos, 2017 <p><u>Foreign Bibliography:</u></p> <ol style="list-style-type: none"> 1. George Omura, Mastering AutoCAD 2012 and AutoCAD LT 2012, George Omura, John Wiley & Sons, 2011 2. Munir Hamad, AutoCAD 2018 Beginning and intermediate, Mercury Learning & Information, 2017 3. Scott Onstott, AutoCAD 2014 Essentials: Autodesk Official Press, John Wiley & Sons, 2013
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