CAD for Civil Engineers - BMEEOFTAT41

I. Subject Specification

1. Basic Data

1.1 Title

CAD for Civil Engineers

1.2 Code

BMEEOFTAT41

1.3 Type

Module with associated contact hours

1.4 Contact hours

Type	Hours/week / (days)
Seminar	2

1.5 Evaluation

Midterm grade

1.6 Credits

2

1.7 Coordinator

name	Dr. Árpád Somogyi
academic rank	Assistant professor
email	somogyi.arpad@emk.bme.hu

1.8 Department

Department of Photogrammetry and Geoinformatics

1.9 Website

https://epito.bme.hu/BMEEOFTAT41
https://fiek2.mywire.org/course/view.php?id=429

1.10 Language of instruction

hungarian and english

1.11 Curriculum requirements

Compulsory in the Civil Engineering (BSc) programme

1.12 Prerequisites

1.13 Effective date

5 February 2020

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2. Objectives and learning outcomes

2.1 Objectives

Besides an overview on CAD systems and application fields, students will learn the 2D drawing commands that enable carrying out basic design tasks. Layer management, block definition and applying annotations and dimensions are discussed in detail. Learning printing options and parameters supports further design works in the BSc civil engineering program. The aim of the course is to let students understand the potential and capabilities of CAD systems and their applications. The course introduces the basic spatial drawing solutions providing bases for high level courses involving 3D constructions, BIM applications.

2.2 Learning outcomes

Upon successful completion of this subject, the student:

A. Knowledge

1. has an overview on the main application fields of CAD.
2. knows the main CAD drawing functions; drawing commands of geometric elements, modifying, constructing.
3. knows the CAD layer management concept.
4. knows the CAD block definition and management concept.
5. knows the CAD printing settings and options.
6. knows the dimension and annotation settings and options applied in CAD systems.
7. knows the most widely used coordinate systems in CAD.
8. knows how to create/modify spatial solid objects in CAD, and adequately applies them in particular tasks.
9. knows the limitations of CAD systems

B. Skills

1. creates and executes optimal drawing process to a particular drawing.
2. creates, sets and applies appropriate layer structure for the particular drawing.
3. is able to work in appropriate 2D/3D coordinate systems.
4. is able to create sections, views and define printer settings of 2D drawings and 3D solids.
5. selects optimal strategy for drawing 3D solids.
6. creates blueprints from 3D solids and applies dimensions.
7. defines dimension settings.

C. Attitudes

1. aims to create accurate and correct drawings.

D. Autonomy and Responsibility

1. independently creates own drawings.
2. approves the relevant lecturer opinion and applies it in further works.

2.3 Methods

Laboratory practices in computer lab under lecturer guidance.

2.4 Course outline

Week	Topics of lectures and/or exercise classes
1.	CAD overview: historical development, CAD systems, CAD-based systems, BIM, AutoCAD environment, basic settings.
2.	Drawing commands, drawing elements (point, line, polyline, polygon, divide, hatch), coordinate systems)absolute/relative, polar), dynamic input, snap functions (orthogonal/object based)
3.	Mdifying commands (trim/lengthen, mirror, offset, array, copy, move, fillet, explode)
4.	Layer management. Sample drawings including layers.
5.	Blocks and annotation. Creating, inserting and modifying blocks. Annotation functions (text, dimensions, table).
6.	Print settings, publishing simple 2D drawings.
7.	Complex drawing.
8.	Overview
9.	Defining spatial coordinate systems (dynamic and manual settings), creating and modifying simple solids
10.	Drawing 3D solids, creating section and printing from layout.
11.	Complex 3D drawing practice.
12.	Independent 3D drawing practice.
13.	Independent 3D drawing practice.
14.	Overview.

The above programme is tentative and subject to changes due to calendar variations and other reasons specific to the actual semester. Consult the effective detailed course schedule of the course on the subject website.

2.5 Study materials

a) Online materials:

1. AutoCAD tutorial
2. Sample drawings

2.6 Other information

1) According to lecturer's approval, own laptop can be used.

2.7 Consultation

The instructors are available for consultation during their office hours, as advertised on the department website. Special appointments can be requested via e-mail: lovas.tamas@mail.bme.hu

This Subject Datasheet is valid for:

2023/2024 semester I

II. Subject requirements

Assessment and evaluation of the learning outcomes

3.1 General rules

The assessment of the learning outcomes specified in clause 2.2 above and the evaluation of student performance occurs via 2 midterm laboratory tests.

3.2 Assessment methods

Evaluation form	Abbreviation	Assessed learning outcomes
1. midterm test	T1	A.1-A.7, A.9; B.1-B.4, B.7; C.1; D.1-D.2
1. control test	T2	A.1-A.3, A.5-A.9; B.1-B.7; C.1; D.1-D.2

The dates of deadlines of assignments/homework can be found in the detailed course schedule on the subject's website.

3.3 Evaluation system

Abbreviation	Score
T1	50%
T2	50%
Sum	**100%**

Test is failed if at least 50% of the points is not achieved.

3.4 Requirements and validity of signature

No signature can be obtained.

3.5 Grading system

40 points can be achieved in total (100%), the grades are determined as follows:

Grade	Points (P)
excellent (5)	90<=P
good (4)	80<=P<90%
satisfactory (3)	70<=P<80%
passed (2)	50<=P<70%
failed (1)	P<50%

3.6 Retake and repeat

1. Both tests can be retaken in a combined form in the repeat period.
2. A second retake is also possible – with penalty fee applied – in the repeat period.

3.7 Estimated workload

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Activity	Hours/semester
contact hours	14×2=28
preparation for the courses	14×1=14
preparation for the tests	2×9=18
Sum	**60**

3.8 Effective date

5 February 2020

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2023/2024 semester I