Civil Engineering Representation and Drawing - BMEEOEMAT42

I. Subject Specification

1. Basic Data

1.1 Title

Civil Engineering Representation and Drawing

1.2 Code

BMEEOEMAT42

1.3 Type

Module with associated contact hours

1.4 Contact hours

Type	Hours/week / (days)
Lecture	2
Seminar	2

1.5 Evaluation

Midterm grade

1.6 Credits

4

1.7 Coordinator

name	Vajnáné Dr. Horn Valéria
academic rank	Associate professor
email	horn.valeria@emk.bme.hu

1.8 Department

Department of Construction Materials and Technologies

1.9 Website

https://epito.bme.hu/BMEEOEMAT42
https://fiek2.mywire.org/course/view.php?id=349

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

1 September 2022

2. Objectives and learning outcomes

2.1 Objectives

Establishing and developing students' spatial reasoning ability, acquiring technical drawing what is the expression of communication in technical fields. In the course of the subject students learn four representation systems: perpendicular parallel projection, inclined parallel projection, centric projection and dimensioned representation.
During the semester students get acquainted with the following topics: imaging and reconstruction in Monge's two projection plane imaging systems, representation of space elements in a general and special position, catching, visibility, transformation of field elements, intersection tasks, intersection of solids with plane surfaces into rotation surfaces, levelling, interpenetration of solids with planes and rotation surfaces, shadow editing, line moving generated surfaces which can not be expanded.
Flat surface elements and simple rotating surfaces representation in perpendicular - parallel and oblique - parallel projection systems.
Representation of flat elements and simple rotating surfaces in a central projection system into two or one focus points onto vertical plane.
Basics of technical drawing are aimed at drawing elements, proportions and scales, reduction and enlargement, preparation of floor plan and cross section.
During the semester, students use the knowledge gained in the above listed topics and prepare their homework.

2.2 Learning outcomes

Upon successful completion of this subject, the student:

A. Knowledge

1. represents spatial elements in different projection systems; performs basic constructions, inserts a spatial element into plane
2. creates a new view of a flat-face solid and of a rotating surface, represent it visually; uses the transformation to determine the shape dimensions
3. draws the intersection of the general and specially positioned planes, of a straight line and a plane, and of straight and curve surfaces; constructs the real surfaces of planes of different and identical inclination roofs
4. plans the intersection with a general plane of a plane-shaped solid, of a plane of rotation, and rotates the sectioned surface into an image plane
5. constructs the intersection of plane-shaped solid and curved surfaces, spread the exposed surface into a plane
6. understands the shadow of the space elements in shadow editing, self-shadow, shadowy edges of solids, shadows to other elements and to the soil
7. edits the representation of perpendicular geometric elements in the dimensioned tasks, solves angular tasks, represent space elements parallel to a plane of projection
8. applies correctly drawing elements on different scales in a technical drawing; constructs floor plan
9. edits a simple section based on a floor plan
10. represents spatial elements in a graphical dimensioned representation system, interprets the inclination of the planes, creates landscaping tasks on smooth terrain, knows the filling and cutting of landscaping
11. acquires the legality of the projection system in orthogonal axonometry, represents space elements, planes and rotation surfaces, depicts a plane-shaped body a clinogonal axonometry
12. familiarizes with the legacy of the perspective, in a vertical plane picture-based system represents plane surfaces with two focus points, curved surfaces with one focus point
13. knows the distortion surfaces generated by straight lines (rotational hyperboloid, hyperbolic paraboloid) and the translational surfaces

14. has an overview of the realized examples in civil engineering practice of special surfaces, distorted surfaces, and the freehand drawing

B. Skills

1. routinely applies basic constructions, determines the visibility on the basis of spatial reasoning
2. compiles the complex editing process by logical thinking
3. using the editing procedures in the homework assignment that described and practiced on the lectures and practice lessons
4. recognizes the wrong solutions and be able to present the right solutions
5. applies the terminology appropriately
6. considers the differences between solutions
7. uses the signalling system of the technical drawing, applies the different scales correctly, be able to reduce or enlarge and draws drawing tasks for thoughtful application of theoretical knowledge
8. constructs a floor plan of a smaller building with using correct drawing elements
9. understands building floor plans

C. Attitudes

1. cooperates with other course members and professors
2. expands geometric and technical drawing knowledge in the process of learning, provides the editing steps with the terms of the construction and justifies its correctness
3. strives for accurate constructions and flawless drawings

D. Autonomy and Responsibility

1. carries out the specified design tasks/home assignments individually
2. open to well-founded critical remarks
3. in certain situations, e.g. in practical classes, helps the editing process on the basis of recognized rules
4. presents her/his opinion with justification

2.3 Methods

Lectures, seminars, consultation in oral and in writing

2.4 Course outline

Week	**Topics of lectures and/or exercise classes**
1.	Rules of technical representation, space elements, basics of two projection representations, catching tasks

2.	Basic edits, transformation, solving measuring tasks with transformation
3.	Intersection tasks, intersection of special and general-position planes, editing of a piercing point, editing of roof form, rotation
4.	Intersection of flat-plane elements and rotating surfaces, determining the true size of the plane section, affinity
5.	Interpenetration of solids with planes and rotation surfaces
6.	Shadow editing, shadows of space elements on a plane projection, on a general plane
7.	Dimensioned representation, angular tasks, representation of a flat elements with specified conditions
8.	Basics of technical drawing, drawing elements, ratio and scale, reduction and enlargement, editing a floor plan
9.	Construction of section and facade
10.	Measured representation, surface construction of building fields
11.	Representing flat-plane solids and rotation surfaces in orthogonal and clinogonal axonometry
12.	Construction of vertical perspective on a plane-shaped body by two focus points, construction of rotating surface with one reference point
13.	The peculiarities of some distortion surfaces
14.	Special curved surfaces

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

Online materials:

1. E-lecture notes: CAN BE DOWNLOADED FROM THE DEPARTMENT'S WEBSITE
2. Civil Engineering Representation-lecture-notes
3. Descriptive Geometry Practice Book
4. Manuals: DATASHEETS, BOOKS RECOMMENDED ON LECTURES
5. Paré, Loving, Hill and Paré's Descriptive Geometry

2.6 Other information

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: dudas.annamaria@emk.bme.hu

This Subject Datasheet is valid for:

Civil Engineering Representation and Drawing - BMEEOEMAT42

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 above in clause 2.2 considers a control test carried out, a mid-term test, the submitted practical sheets, 3 home assignments taking into account and the active participation on the seminars as well.

3.2 Assessment methods

Evaluation form	Abbreviation	Assessed learning outcomes
1 mid-term test (summarizing evaluation)	MT	A.1-A.10; B.1-B.2, B.7-B.8; C.3
1 control test (placement test)	CT	A.1-A.4; B.1
home assignment 1 (one-time evaluation)	HA1	A.1-A.4; B.1-B.4; C.1-C.3; D.1-D.2
home assignment 2 (one-time evaluation)	HA2	A.5-A.6; B.1-B.4; C.1-C.3; D.1-D.2
home assignment 3 (one-time evaluation)	HA3	A.8-A.12; B.1-B.4, B.7-B.9; C.1-C.3; D.1-D.2
Seminars - practical sheets (continuous evaluation)	PR	A.1-A.12; B.1-B.2, B.6-B.9; C.1-C.3; D.1-D.4
active participation (continuous evaluation)	A	A.1-A.14; B.1-B.9

The dates of tests, the handing-out and submission dates of home assignments are detailed in the course schedule on the subject's website.
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
MT	40%
CT	10%
HA1	15%
HA2	15%
HA3	15%
PR	2,5%
A	2,5%
Sum	**100%**

3.4 Requirements and validity of signature

Signature cannot be obtained.

3.5 Grading system

HA0, HA1, HA2, PR, A, are rated with a grade between 1 and 5.
The minimum requirement for obtaining a grade is a passed (2) for both parts of the mid-semester test (passed

for the descriptive geometry and for the engineering drawing part also), and at least a passed (2) for each home assignments. The final grade is calculated according to clause 3.3 in accordance with the general rules of rounding.

For those who fulfil the attendance requirements, the MT and CT grades are determined as follows:

Grade	**Points (P)**
excellent (5)	80 <= P
good (4)	70 <= P < 80%
satisfactory (3)	60 <= P < 70%
passed (2)	50 <= P < 60%
failed (1)	P < 50%

3.6 Retake and repeat

1. A second retake for the mid-semester test (MT) is provided on the delayed submission period with a charge.
2. Control test (CT) can be retake once during the study period.
3. The 1st and the 2nd home assignment (HA1, HA2) can be submitted without a charge on the seminar the week after the normal deadline. The course cannot be accepted with a submission after the delayed deadline.
4. The 3rd home assignment (HA3) and the practical sheets (PR) can be submitted with a charge (amount noted in the policy) on the last day of the delayed submission period until 16:00.
5. The active participation – due to its speciality – cannot be resubmitted or exchanged in any ways.

3.7 Estimated workload

Activity	**Hours/semester**
participation in lectures and seminars	14×4=56
preparation for the seminars	14×0,5=7
preparation for the evaluation	5+20=25
preparation of the home assignments	32
Sum	**120**

3.8 Effective date

1 September 2022

This Subject Datasheet is valid for:

2023/2024 semester I