

GAZIANTEP UNIVERSITY

Faculty of Engineering, Civil Engineering Department

CE 101 Civil Engineering Drawing COURSE OUTLINE

Department	Civil Engineering
Semester	1st Semester (Fall)
Credits	2 (ECTS: 5)
Hours per Week	3 hours (1 hour lecture + 2 hours practice)
Prerequisites	None
Language of Instruction	English
Course Type	Compulsory (Z)
Instructor	Asst. Prof. Dr. Abdulhadi PALA

1. Course Description

This course introduces first-year civil engineering students to engineering drawing as the common graphical language of engineers. Students learn to use manual drawing instruments and standard drawing sheets, and to apply the basic conventions of technical drawing, including ISO line types, sheet layout and title block, dimensioning and scale. The course then develops the ability to move between three and two dimensions: representing a three-dimensional object by its orthographic views, and constructing an isometric drawing of an object from its views. Section views are introduced to show the interior features of objects. In the second half of the semester, the same principles are applied using computer-aided drafting (CAD) software, where students learn to produce, dimension and plot two-dimensional technical drawings. Lectures are supported by in-class workshop sessions and CAD laboratory sessions in which students practice each topic under the guidance of the instructor. The course provides the drawing foundation required for reading and preparing plans, elevations, sections and details in later civil engineering courses and in professional practice.

2. Course Outcomes (CO)

Upon successful completion of this course, students will be able to:

- CO1.** Describe the role of engineering drawing in engineering practice and use drawing instruments, materials and standard drawing sheets correctly.
- CO2.** Apply ISO line types, sheet layout and title block, dimensioning and scale in two-dimensional drawings.
- CO3.** Represent three-dimensional objects by their orthographic views and complete a missing view from two given views.
- CO4.** Construct isometric drawings and section views of objects from given orthographic views.
- CO5.** Produce, dimension and plot two-dimensional technical drawings using computer-aided drafting (CAD) software.

3. Weekly Schedule

Week	Topic	Course Outcomes
1	Course Overview; Introduction to Engineering Drawing; Drawing Instruments and Materials	CO1
2	Drawing Sheets, Line Types, Dimensioning and Scale; Orthographic Views (3D to 2D)	CO2, CO3
3	Workshop: Basic Drawing and Orthographic Views	CO2, CO3
4	Workshop: Orthographic Views	CO3
5	Isometric Drawing (2D to 3D)	CO4
6	Workshop: Isometric Drawing	CO4
7	Midterm Examination	CO1–CO4
8	CAD: Interface, Coordinate Input and Basic Drawing Commands	CO5
9	CAD: Modify Commands	CO5
10	CAD: Layers, Line Types and Line Weights	CO2, CO5
11	CAD: Text and Dimensioning	CO2, CO5
12	Section Views; CAD: Hatching and Blocks	CO4, CO5
13	CAD: Layouts, Scale and Plotting	CO2, CO5
14	CAD Practical Examination	CO5
Final	Final Examination (final examination period)	CO1–CO5

4. Weekly Topic Descriptions

Week 1: Course Overview; Introduction to Engineering Drawing; Drawing Instruments and Materials

The course organization, weekly plan, assessment methods and course policies are introduced, together with the drawing kit that students are required to bring from Week 3 onwards. Engineering drawing is then presented as the common language of engineers: its purpose, the main types of drawings, and the difference between manual and computer-aided drawing. The drawing instruments and materials used in the course are introduced one by one, with their function and correct use. Standard drawing sheet sizes from A0 to A4 are shown, and the A3 and A4 sheets used in the course are introduced.

Week 2: Drawing Sheets, Line Types, Dimensioning and Scale; Orthographic Views (3D to 2D)

Students learn to prepare a drawing sheet with a frame and title block, which is required on every drawing throughout the course. ISO line types and their uses are presented, followed by the basic rules of dimensioning two-dimensional shapes and the concept of drawing scale. The second part of the session introduces the representation of a three-dimensional object on a two-dimensional sheet: the principal views (front, top and side), their arrangement and alignment, the use of visible, hidden and center lines in the views, and the construction of a third view from two given views.

Week 3: Workshop: Basic Drawing and Orthographic Views

A supervised drawing session in which students apply the topics of Weeks 1 and 2 on A3 and A4 sheets. The exercises cover sheet layout and title block, line types, dimensioning and scale of two-dimensional shapes, and the first orthographic view exercises. Completed sheets are submitted for evaluation as part of the workshop grade.

Week 4: Workshop: Orthographic Views

A second supervised drawing session focused on orthographic views. Students draw the principal views of simple objects from given pictorial drawings and complete missing views from two given views, applying correct line types, view alignment and dimensioning.

Week 5: Isometric Drawing (2D to 3D)

The reverse process is introduced: constructing a three-dimensional representation of an object from its two-dimensional views. The session covers the isometric axes, measurement along the isometric axes, and the step-by-step construction of isometric drawings of simple objects from given orthographic views.

Week 6: Workshop: Isometric Drawing

A supervised drawing session in which students construct isometric drawings of simple objects from their orthographic views on A3 and A4 sheets. The session also serves as a review of the topics covered before the midterm examination.

Week 7: Midterm Examination

The midterm examination covers the topics of Weeks 1 to 6 and is conducted with drawing instruments.

Week 8: CAD: Interface, Coordinate Input and Basic Drawing Commands

The first CAD laboratory session. Students are introduced to the interface of the CAD software, drawing units, the command line and coordinate input methods (absolute, relative and polar). Basic drawing commands (line, circle, arc, rectangle and polygon) and object snaps are practiced on simple two-dimensional shapes, including shapes previously drawn by hand.

Week 9: CAD: Modify Commands

Editing and modification commands such as erase, move, copy, rotate, mirror, offset, trim, extend, fillet, chamfer, array and scale are introduced and applied to build more complex two-dimensional drawings efficiently.

Week 10: CAD: Layers, Line Types and Line Weights

The ISO line types learned in manual drawing are implemented in CAD through layers. Students create layers for visible, hidden and center lines, assign line types and line weights to them, and use them to draw the orthographic views of simple objects.

Week 11: CAD: Text and Dimensioning

Text styles and dimension styles are set up, and linear, aligned, radius, diameter and angular dimensions are applied. The dimensioning rules learned in manual drawing are used to dimension orthographic views correctly in CAD.

Week 12: Section Views; CAD: Hatching and Blocks

The concept of section views is introduced: the cutting plane, the resulting section view and the section lining (hatching) used to show cut surfaces, applied to simple objects. In the laboratory, section views are drawn using the hatching tools of the CAD software, and repeated elements are created and inserted as blocks.

Week 13: CAD: Layouts, Scale and Plotting

Students prepare a complete drawing sheet in CAD: model space and layouts, viewports and viewport scale, frame and title block, and plotting to PDF or to a printer. The session also serves as a review and preparation for the CAD practical examination.

Week 14: CAD Practical Examination

The CAD practical examination is conducted in the CAD laboratory. Students produce a dimensioned two-dimensional technical drawing using CAD software within a given time.

5. Workshop and Laboratory Sessions

5.1 Workshop Sessions

Workshop sessions are held in Weeks 3, 4 and 6. They are supervised drawing sessions in which students apply the topics presented in the preceding lecture weeks, while the instructor follows each student's work and provides individual guidance. Every workshop drawing is prepared with drawing instruments on an A3 or A4 sheet with a frame and title block. Completed sheets are submitted at the end of the session and evaluated on the basis of correctness, correct application of drawing conventions (line types, view arrangement, dimensioning and scale), accuracy and neatness. Students are required to bring their complete drawing kit (Section 6.3) to every workshop session.

5.2 CAD Laboratory Sessions

CAD sessions are held in Weeks 8 to 13 in the CAD laboratories of the Gaziantep University Department of Information Processing (Bilgi İşlem Daire Başkanlığı). All CAD work is carried out on the laboratory computers, and no software installation on personal computers is required. Each session begins with a short demonstration of the commands of the week, followed by hands-on practice. The exercises are based on the topics already studied in manual drawing, so that students apply the same drawing rules (line types, orthographic views, dimensioning, sections and scale) with a computer-aided drafting tool.

6. Course Materials and Resources

6.1 Lecture Materials

The primary course materials are the lecture presentations prepared by the course instructor. The presentations are visual and step-by-step, supported by drawings and figures that show how each drawing is constructed, and are shared with students in digital format.

6.2 Textbooks

Textbook: F. E. Giesecke et al., *Technical Drawing with Engineering Graphics*, 15th ed., Pearson, 2016.

Supplementary reference: C. H. Simmons, D. E. Maguire and N. Phelps, *Manual of Engineering Drawing*, 5th ed., Elsevier, 2020.

6.3 Required Drawing Kit

Each student must obtain the following drawing kit and bring it to every workshop session and to the midterm examination, starting from Week 3:

1. Drawing board
2. T-square
3. Set squares (45° and 30°/60°)
4. Wooden drawing pencils
5. Pencil sharpener
6. Eraser
7. Compass
8. Rulers (30 cm and 60 cm)
9. Protractor
10. Drafting tape
11. Drawing paper (A3 and A4)
12. Sheet folder

6.4 Software

Computer-aided drafting (CAD) software is used in the CAD laboratory sessions (Weeks 8 to 13) and in the CAD practical examination. The software is available on the computers of the CAD laboratories of the Department of Information Processing; students are not required to install it on their personal computers.

7. Assessment and Grading

Component	Quantity	Weight (%)
Midterm Examination	1	25
CAD Practical Examination	1	25
Workshop Studies	3	10
Final Examination	1	40
Total		100

The midterm examination covers the topics of Weeks 1 to 6 and is conducted with drawing instruments. The CAD practical examination covers the CAD topics of Weeks 8 to 13 and is conducted in the CAD laboratory. The final examination is comprehensive, covering the topics addressed throughout the semester. Workshop studies are evaluated as described in Section 5.1.

8. Course Policies

8.1 Attendance

In accordance with Article 22 of the Gaziantep University Undergraduate Education Regulations, students are required to attend a minimum of 70% of all scheduled lecture sessions. Students who fail to satisfy the attendance requirement shall not be permitted to take the final examination and will receive a grade of NA (Non-Attendance). Attendance records are monitored by the course instructor throughout the semester. Regular attendance is expected at all workshop and laboratory sessions, since these sessions form the practical part of the course.

8.2 Drawing Rules

Every drawing prepared in workshop sessions and examinations must be drawn on an A3 or A4 sheet with a frame and title block. The title block contains the university and department, the student's name, student number, education type (first or second education) and signature. Students keep all their workshop sheets in their sheet folder throughout the semester.

8.3 Academic Integrity

All workshop drawings and CAD files must be the student's own work. Copying drawings or drawing files from other students, or submitting work prepared by others, is treated as academic dishonesty and will result in disciplinary action in accordance with the university's academic integrity policies.

8.4 Language of Instruction

All lectures, course materials, workshop and laboratory sessions, and examinations are conducted in English.

9. Announcements and Course Documents

All course announcements and required documents will be shared on the instructor's web page:

https://akbis.gaziantep.edu.tr/detay/?A_ID=301343_doktor-ogretim-uyesi_abdulhadi-pala

Prepared by: Asst. Prof. Dr. Abdulhadi PALA

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