GAZIANTEP UNIVERSITY

Faculty of Engineering – Department of Civil Engineering

CE 104 – Introduction to Civil Engineering

COURSE OUTLINE

Department	Civil Engineering / General
Semester	2nd Semester (Spring)
Credits	2 (ECTS: 2)
Hours per Week	2 hours (Lecture)
Prerequisites	None
Language of Instruction	English
Course Type	Compulsory (Z)
Instructor	Assoc. Prof. Dr. Mehmet Tolga GÖĞÜŞ

1. Course Description

This course is designed to provide first-year civil engineering students with a comprehensive introduction to the profession, its scope, and its societal role. The course addresses the fundamental sub-disciplines of civil engineering, types of structures and their basic components, digital tools and software utilized in engineering practice, the current state and future trajectory of the construction industry, sustainability principles, labor law awareness, and professional ethics. Furthermore, the course aims to develop students' technical communication competencies through structured training in technical report writing and oral presentation delivery. Through departmental and laboratory tours, guest lectures from industry and academia, interactive assessment activities, and site visits, the course seeks to establish a strong sense of professional identity and equip students with the foundational awareness necessary for their subsequent academic and professional development.

2. Course Objectives (CO)

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

1. **CO1.** Demonstrate a fundamental understanding of the civil engineering profession, its principal sub-disciplines, and the departmental facilities and resources available for academic and research activities.
2. **CO2.** Identify the main types of civil engineering structures and their basic structural components.
3. **CO3.** Recognize the key software and digital tools employed in civil engineering practice and their respective areas of application.
4. **CO4.** Comprehend the current state of the construction industry, emerging technologies including artificial intelligence, and future trends shaping the profession.

5. **CO5.** Understand the principles of sustainable development as they relate to civil engineering practice.
6. **CO6.** Develop an awareness of labor law fundamentals and professional ethical responsibilities pertinent to engineering practice.
7. **CO7.** Prepare a properly structured technical report adhering to accepted academic and professional standards.
8. **CO8.** Deliver an effective oral presentation utilizing appropriate visual aids and communication techniques.

3. Weekly Schedule

Week	Topic	Course Outcomes
1	Welcome to Civil Engineering: Who Are We?	CO1
2	The World of Civil Engineering: Sub-disciplines Overview	CO1
3	Discovering Our Department: Labs, Facilities and Resources	CO1, CO2
4	Types of Structures and Basic Structural Components	CO2
5	Software and Digital Tools in Civil Engineering	CO3
6	The Construction Industry: Current State, Emerging Technologies & The Future	CO4
7	Sustainability and Sustainable Development in Civil Engineering	CO5
8	Labor Law Awareness and Professional Ethics for Engineers	CO6
9	Technical Report Writing: How Engineers Communicate on Paper	CO7
10	Oral Presentation Skills: How Engineers Communicate in Person	CO8
11	Student Presentations (Session 1)	CO8
12	Student Presentations (Session 2)	CO8
13	Student Presentations (Session 3)	CO8
14	Guest Speaker & Closing: Is This the Right Path for You?	CO1–CO8

4. Weekly Topic Descriptions

Week 1 – *Welcome to Civil Engineering: Who Are We?*

Introduction to the Department of Civil Engineering, including the academic staff, departmental mission and vision, and a comprehensive overview of the curriculum structure. Students are provided with a detailed roadmap of the courses they will undertake throughout their education and the interconnections among these courses. The session initiates an open discussion centered on the question “Why civil engineering?” with the objective of fostering a sense of professional belonging and institutional identity from the outset of the academic program.

Week 2 – *The World of Civil Engineering: Sub-disciplines Overview*

A systematic overview of the principal sub-disciplines within civil engineering: structural engineering, geotechnical engineering, transportation engineering, water resources engineering, environmental engineering, and construction management. Each discipline is introduced through a concise definition accompanied by illustrative real-world project examples. This session establishes the necessary theoretical foundation prior to the physical facility tour scheduled in the subsequent week, enabling students to contextualize the laboratory and departmental resources within the broader framework of the profession.

Week 3 – *Discovering Our Department: Labs, Facilities and Resources*

A guided on-site tour of the departmental facilities, encompassing the structural engineering laboratory, the geotechnical engineering laboratory, classrooms, and computational resources. At each facility, students receive comprehensive briefings on the nature of research and testing activities conducted therein and how these activities correspond to the sub-disciplines introduced in Week 2. This session is conducted entirely outside the conventional classroom environment, providing students with direct exposure to the physical infrastructure that supports their academic program.

Week 4 – *Types of Structures and Basic Structural Components*

An introduction to the primary categories of civil engineering structures, including buildings, bridges, dams, tunnels, retaining walls, and coastal structures. The session further addresses fundamental structural components such as columns, beams, slabs, foundations, frames, and trusses. Visual materials and short video content are employed to develop students' ability to identify basic structural elements and comprehend fundamental load transfer mechanisms within structural systems.

Week 5 – *Software and Digital Tools in Civil Engineering*

An overview of the principal software and digital tools utilized across various domains of civil engineering practice. Topics include AutoCAD for technical drafting, SAP2000 and ETABS for structural analysis and design, Geographic Information Systems (GIS) for transportation and water resources applications, Building Information Modeling (BIM) through Revit, MATLAB for numerical computation, and the application of spreadsheet tools in engineering calculations. The objective is to establish awareness of the digital competencies students will progressively acquire throughout their education and the specific professional functions each tool serves within the discipline.

Week 6 – *The Construction Industry: Current State, Emerging Technologies & The Future*

An examination of the organizational structure of the construction industry, encompassing the roles of clients, contractors, engineering consultancies, and supervisory bodies. The session addresses the current state of the industry both in Turkey and internationally, followed by a comprehensive discussion of emerging trends including prefabrication, modular construction, digitalization, green construction practices, and the increasingly significant role of artificial intelligence in design optimization, project management, and construction site operations. The session concludes with a forward-looking perspective on the evolving competencies and expectations placed upon the next generation of civil engineers.

Week 7 – *Sustainability and Sustainable Development in Civil Engineering*

An exploration of sustainable development principles and their direct relevance to civil engineering practice. Topics include the carbon footprint associated with construction activities, green building concepts and internationally recognized certification frameworks, environmental implications of material selection decisions, life-cycle assessment methodologies for structures and infrastructure, and circular economy principles within the construction sector. The session is designed to cultivate a critical awareness of the environmental responsibilities inherent in engineering practice and to encourage students to evaluate the long-term ecological and social impact of engineering decisions on future generations.

Week 8 – *Labor Law Awareness and Professional Ethics for Engineers*

A dedicated session focused on developing professional legal and ethical consciousness among engineering students. A guest lecturer from the Faculty of Law delivers a structured presentation addressing fundamental labor law concepts pertinent to engineering practice, including employment contracts, occupational health and safety regulations, and the rights and obligations of both employees and employers. The session further encompasses engineering ethics through the examination of real-world case studies, the institutional role of professional chambers such as the Chamber of Civil Engineers (İMO) and the Union of Chambers of Turkish Engineers and Architects (TMMOB), and the broader framework of professional accountability in engineering practice.

Week 9 – *Technical Report Writing: How Engineers Communicate on Paper*

A workshop-format session dedicated to the principles and conventions of technical report writing. The session covers the standard structure of a technical report, including the title page, abstract, introduction, methodology, results and discussion, conclusion, and references. Additional topics include appropriate academic language and tone, formatting conventions, academic integrity, and proper citation and referencing practices. Students engage in a comparative analysis of well-structured and poorly-structured report examples, followed by a peer-review exercise in which they compose a short passage and critically evaluate each other's written work. The individual technical report assignment is distributed during this session.

Week 10 – *Oral Presentation Skills: How Engineers Communicate in Person*

A practical session focused on the development of effective oral presentation competencies essential for professional engineering practice. Topics include slide design principles emphasizing visual clarity and information hierarchy, body language and audience engagement techniques, time management strategies during presentations, and structured methods for handling question-and-answer sessions. Group presentation topics and the presentation schedule are finalized during this session. A preliminary warm-up exercise is conducted in which each student delivers a 60-second oral explanation of a selected topic to develop confidence in public speaking.

Week 11 – *Student Presentations (Session 1)*

The first session of student group presentations. Each group delivers their presentation on the assigned civil engineering topic, followed by an interactive Kahoot quiz comprising questions prepared by the presenting group based on their topic content. Assessment is conducted through a combination of peer

evaluation forms and instructor grading criteria, with constructive feedback provided to each group to support continuous improvement.

Week 12 – *Student Presentations (Session 2)*

Continuation of student group presentations following the established format: group presentation delivery, interactive Kahoot quiz, and combined peer and instructor evaluation. Students are expected to demonstrate progressive improvement informed by the feedback provided in previous sessions.

Week 13 – *Student Presentations (Session 3)*

The final session of student group presentations. All remaining presentations are delivered and assessed in accordance with the established evaluation criteria. A class-wide vote is conducted to identify and recognize the most outstanding presentations of the semester.

Week 14 – *Guest Speaker & Closing: Is This the Right Path for You?*

The concluding session of the course features a guest speaker from the construction industry, potentially organized in a panel discussion format. A comprehensive review of the course content and key learning outcomes is presented, followed by an open reflective discussion addressing the question: “After these fourteen weeks, do you see yourself pursuing this profession?” An anonymous course evaluation survey is administered to gather student feedback. The session concludes with the presentation of awards and recognition for the highest-rated presentations and technical reports of the semester.

5. Extracurricular Activities

5.1 Construction Site Visits

In addition to the scheduled weekly sessions, construction site visits are planned as extracurricular activities to provide students with first-hand exposure to real-world engineering practice. These visits are organized outside regular class hours and are designed to complement the theoretical content delivered in the classroom. Site visits may include active construction projects in the Gaziantep metropolitan area, covering various types of civil engineering works such as building construction, infrastructure development, and transportation projects. During each visit, students are expected to observe construction processes, identify structural components and construction techniques discussed in the course, and engage with site engineers and project managers. Students are required to comply with all occupational health and safety regulations during site visits, including the use of personal protective equipment (PPE). Site visit observations may be incorporated into technical report assignments or presentation topics at the discretion of the course instructor.

5.2 Guest Speakers and Industry Lectures

Throughout the semester, guest speakers from both the public and private sectors are invited to deliver lectures and participate in discussion sessions. These speakers include experienced civil engineers holding senior positions in construction companies, engineering consultancies, public institutions, and regulatory bodies. The guest lecture program is designed to bridge the gap between academic education and professional practice by providing students with direct insights into industry expectations, career trajectories, and the practical realities of the engineering profession. In Week 8, a faculty member from

the Faculty of Law is specifically invited to deliver a structured presentation on labor law fundamentals relevant to engineering practice. In Week 14, the closing session is dedicated to a guest speaker or panel from the construction industry, offering students the opportunity to engage in an interactive dialogue about their prospective careers. Additional guest lectures may be scheduled throughout the semester as opportunities arise, and students are encouraged to actively participate in question-and-answer sessions to maximize the benefit of these interactions.

6. Course Materials and Resources

6.1 Lecture Materials

The primary course materials consist of lecture presentations prepared by the course instructor. These presentations are delivered in digital format (PowerPoint/PDF) and made available to students through the university's learning management system prior to each session. Presentations incorporate visual aids including photographs of real-world projects, structural diagrams, schematic illustrations, and short video content to enhance comprehension and engagement. Supplementary reading materials, including selected book chapters, technical articles, and industry reports, may be assigned for specific topics at the instructor's discretion.

6.2 Interactive Assessment Tools

The course employs Kahoot, a game-based learning platform, as an interactive assessment and engagement tool. Kahoot quizzes are conducted at the conclusion of selected lecture sessions (particularly following Weeks 2, 4, 6, and 8) and after each student group presentation (Weeks 11–13). Quiz questions are designed to reinforce key concepts covered in the session and to promote active participation. During presentation weeks, the presenting group is responsible for preparing the Kahoot quiz questions based on their topic content. Students who demonstrate consistent participation and high performance in Kahoot activities may receive recognition through bonus points or symbolic awards at the instructor's discretion.

6.3 Technical Report Writing Resources

Students are provided with a technical report writing guide that specifies the required report structure, formatting conventions, citation standards, and evaluation rubric. Sample reports demonstrating both exemplary and substandard practices are distributed during the Week 9 workshop session to facilitate comparative learning. A peer-review checklist is also provided to guide students in evaluating each other's written work during the workshop exercise.

6.4 Presentation Resources

A presentation guidelines document is provided to students specifying the expected format, duration, visual design principles, and evaluation criteria for group presentations. This document is distributed during the Week 10 workshop session alongside the finalized presentation schedule. Peer evaluation forms are provided for use during presentation sessions (Weeks 11–13) to facilitate structured feedback from the audience.

6.5 Software Demonstrations

During the Week 5 session on digital tools in civil engineering, students are exposed to the principal software platforms used in the profession through live demonstrations or pre-recorded screen capture videos. These demonstrations are intended to provide an introductory-level familiarity with the software interfaces and their general capabilities, rather than hands-on training. Students are encouraged to explore freely available trial versions or student editions of selected software to supplement their learning.

7. Assessment and Grading

Component	Quantity	Weight (%)
Midterm Examination	1	30
Final Examination	1	40
Group Presentation & Kahoot Activities	1	30
Total		**100**

The midterm examination covers the content delivered in Weeks 1 through 7. The final examination is comprehensive, covering all topics addressed throughout the 14-week semester. Group presentations are evaluated based on content accuracy, slide design quality, delivery effectiveness, adherence to time constraints, and the quality of Kahoot quiz questions prepared by the presenting group. Peer evaluation scores are incorporated as a supplementary component of the presentation assessment. Detailed evaluation rubrics for both the technical report and oral presentations are provided to students in advance.

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 and evaluated by the course instructor throughout the semester. Regular attendance is expected for all scheduled sessions, including laboratory and facility tours. Attendance during construction site visits and guest lectures, although conducted outside regular class hours, is strongly encouraged and may be considered in the overall course evaluation.

8.2 Academic Integrity

All submitted work must represent the student's own effort. Plagiarism, unauthorized collaboration, or any form of academic dishonesty will result in disciplinary action in accordance with the university's academic integrity policies. Proper citation and referencing of all sources is required in technical reports and presentations.

8.3 Language of Instruction

All lectures, course materials, examinations, technical reports, and oral presentations are conducted and submitted in English.

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