Yeditepe University Civil Engineering Department
CE 492 Engineering Project-Spring 2026
Proposal Form

Supervisors Name/s	**Almıla Uzel**
Project Title	***Comparative Study of Slab Types for Sustainable Design***
Project Reference No*	
Relevant course/s for the project	**CE381 – CE491**

Project Summary:
In this project the environmental impact of four different slab types is studied. The project starts with choosing appropriate dimensions and loadings for a simple floor layout. Four different slab types are considered, flat plate; flat slab; slab with drops and two-way slab with beams. Preliminary slab thickness is chosen as per code-based requirements for each different slab type. Detailed analyses are carried out to optimize the slab thickness using a commercially available program, namely, SAFE (CSI). Each student designs one type of slab. After detailing slab reinforcement, each student carries out the calculation of concrete and steel material quantity. Embodied energy calculation and discussion of results are carried out as a whole team. Students present a report which summarizes the engineering calculations, methods and limitations considered in the design. Additionally, students hand in structural drawings of floor plans, sections and rebar details.

Project Achievements:	
Identifying specific <u>design objectives</u> based on project requirements:	1) Drawing framing plans of each slab type using ACAD. 2) Choosing appropriate loading values based on the occupancy of the building.
Gathering and using relevant information	1) Outlining code requirements. 2) Determining appropriate loading values according to design standards and product catalogs. 3) Installation and obtaining licenses of CSI programs used during the design of the slabs.

<u>Analyzing alternatives</u> using appropriate engineering knowledge	Slabs account for about 80% of the total self-weight of a multi-story building. Therefore, any saving in slabs results in smaller columns, lower earthquake loads and foundation loads. Students make sure that the slab thickness satisfies both deflection and punching shear strength requirements. Students achieve a suitable design by **<u>either changing the thickness of the slab or size of columns whichever is economical yet practical.</u>** Students' design decisions are evaluated and discussed every week.

Considering the relevant constraints in the design: *(Please explain how the proposed project considers one or more limitations listed below)*	
Economy **Environmental Issues/Sustainability** **Manufacturability**	1) By optimizing slab thickness, a more economical design is achieved. 2) Reduced material quantity means need for less resources to produce these materials which in turn means sustainable design.

Definition of outcomes linked to the objectives of projects	"Engineering Project" aims the students to gain the 1) ability of usage their knowledge in mathematics, science and engineering, 2) ability to identify and solve complex engineering problems, 3) design experience, 4) ability to use modern tools and employ needed information technologies, 5) ability to conduct experiments if needed, gather data and analyze results, 6) routine of combining their individual creativity with teamwork, 7) oral and written presentation experiences in foreign language, 8) ability to access information and recognition of the need for following developments in science and technology, 9) awareness of professional and ethical responsibility, 10) information about business life practices like project management and risk management, 11) awareness of effects of their engineering practices on health, environment, and safety, 12) awareness of project award mechanisms and tendering procedures, 13) awareness of the interaction of designers and constructors. *(Minimum requirements are;* ○ *project timeline,* ○ *abstract,* ○ *Türkçe özet,* ○ *the definition of the problem,* ○ *the scientific information and literature review,* ○ *different design alternatives and decision criteria,* ○ *selection of optimum alternative* ○ *economical, sustainability, ethical issues* ○ *engineering drawing and demonstration methods while presenting the solution* ○ *appendix including standards, patents, brochures etc.)*

Approval of the Project	**Approved** ☐	**Not Approved** ☐
State the reason(s) if not approved:		
Department Chair: Dr. Öğr. Üyesi Özgür KÖYLÜOĞLU		Signature

* *Project Ref.Numbers will be given by the Engineering Design Project Committee*