**Yeditepe University Civil Engineering Department**

**CE 492 Engineering Project-Spring 2021**

**Proposal Form**

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| **Supervisors Name/s** | Almıla Uzel |
| **Project Title** | ***Comparative Study of Shallow Foundation Types for Sustainable Design*** |
| **Project Reference No\*** |  |
| **Relevant course/s for the project** | CE381 - CE491 |

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| **Project Summary:** |
| In this project the environmental impact of different foundation types is studied. Foundation system of a 7 -Story building is designed according to TBEC2018 and TS500. The forces acting on the foundation due to different load combinations are taken from a former CE492 project. Three different shallow foundation types are considered, Detailed analyses are carried out to optimize the foundation thickness using a commercially available program, namely, SAFE (CSI). After detailing foundation reinforcement, students carry 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. In addition, students hand in structural drawings of foundation plans, relevant sections and rebar details. |

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| **Project Achievements:** | |
| **Identifying specific design objectives based on project requirements:** | 1) Drawing framing plans of each foundation type using ACAD.  2) Transferring loading values from former ETABS analysis. |
| **Gathering and using relevant information** | 1) Outlining code requirements.  2) Determining soil type.  3) Installation and obtaining licenses of CSI programs used during the design of the slabs. |
| **Analyzing alternatives using appropriate engineering knowledge** | Three different shallow foundation types are considered, Detailed analyses are carried out to optimize the foundation thickness using a commercially available program, namely, SAFE (CSI). Students make sure that the design satisfies both serviceability and strength requirements. Students’ design decisions are evaluated and discussed every week. |

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| **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 foundation 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. |

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| **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.)* |

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| **Approval of the Project Approved Not Approved**  State the reason(s) if not approved: | |
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| **Department Chair:**  Prof. Dr. Nesrin YARDIMCI TİRYAKİOĞLU | Signature |

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