



**MARMARA UNIVERSITY  
FACULTY OF ENGINEERING  
ENVIRONMENTAL ENGINEERING DEPARTMENT**

**ENVE 4197/4198 ENGINEERING PROJECT  
PROPOSAL FORM  
FALL 2025-2026**

**Instructor :** Asst. Prof. Hatice Yesil

**Project Title :** Waste Plastic Management and Climate Impact: Scenario-Based Carbon Reduction Potential in the Retail Sector **(TÜBİTAK-2209A)**

**Proposal No. :** HYesil\_1

**Number of Students :** 2 students **(Eylül Hazal Akkaya and Zehra Horoz)**

**Requirements (from students) :** Students are expected to collect and organize data, perform literature search, use Excel or MATLAB for calculations, generate alternative scenarios, and analyze the results.

**Scope of the Project :**

This project evaluates a retail company's plastic and carbon footprints and explores alternative ecological scenarios to identify strategies for reducing environmental impact.

**Hardware/Software/Lab/Equipment Requirements :**

At least one laptop per student equipped with an external hard disk for data storage  
Microsoft Office Programs (Excel, Word, PowerPoint),  
Endnote for citation and reference list  
MatLab (if required)  
Remote access to databases in Departments of Library and Documentation)

**Development Plan :**

The project involves three main phases: (1) data collection and processing, where students will gather product sales, packaging types, and recycling information from a supermarket, emission factors for different plastic-based materials, and end-of-life impacts from literature, (2) students will calculate the plastic footprint and plastic-based carbon footprint to evaluate the supermarket's current environmental impact, (3) students will apply alternative strategies, such as increasing recycling rates or substituting conventional plastics with bioplastics, and compare the outcomes with the current situation, producing clear visualizations and summarized results to inform sustainable decision-making.