



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

**ENVE 4197/4198 ENGINEERING PROJECT
PROPOSAL FORM
FALL 2019**

Instructor: Prof. Dr. Mete Tayanç

Project Title: STUDY OF BLACK CARBON LEVELS IN THE ATMOSPHERE OF İSTANBUL

Proposal No.: *MeteTayanç-1*

Number of Students: Max 3 students

Requirements (from students): Student should be able to spend a minimum of 10 hours each week. Student should have lab experience, especially on particulate matter sampling and analysis, and mobility to go to Yıldız Technical University to do the sample collection. A BAPKO project is going to be submitted in the leadership of Doç. Dr. Bülent O. Akkoyunlu.

Scope of the Project:

Black carbon is a powerful global warming component of particulate matter caused by incomplete combustion of fossil fuels, wood and other fuels. Full combustion converts all carbon in the fuel to carbon dioxide (CO₂), but combustion is never complete and in the process, together with CO₂, carbon monoxide, volatile organic compounds, organic carbon and black carbon particles are formed. Particulate matter is a complex pollutant depending on its composition; it may have a cooling or heating effect on the local and global climate. For example, black carbon, one of the important PM component absorbs sunlight and infrared rays in the atmosphere and therefore has a heating effect, unlike other types of atmospheric particles. However, black carbon, a key component of small atmospheric particles (PM_{2.5}), which can lead to lung and internal respiratory diseases, leading to early child mortality in high-intensity exposures, can be an important health problem. Many studies have shown that measures to prevent black carbon emissions can reduce short-term warming of the climate, increase crop yields and prevent premature deaths. In this study, black carbon measurements will be carried out in İstanbul during stable atmospheric conditions to determine black carbon concentrations during critical times. Another objective of the study is to determine relationship between the black carbon concentration and aerosol concentration using satellite data products such as OMAERUV (OMI/Aura Near UV Aerosol Optical Depth and Single Scattering Albedo) together with the ground measurements.

Hardware/Software/Lab/Equipment Requirements:

Be able to use the devices in the lab and data analysis information is necessary.

Development Plan:

Time schedule will be prepared to perform measurement/analysis of particulate matter for black carbon at İstanbul and OMAERUV study.