



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

**ENVE 4197/4198 ENGINEERING PROJECT
PROPOSAL FORM
FALL 2023**

Instructor : Zehra Semra Can

Project Title : Adsorptive Removal of Dye from Textile Industry Effluent by Zr-MOF

Proposal No. : ZehraSCan-1

Number of Students : 4

Requirements (from students):

****Students should have a weekly schedule that is suitable to spend a minimum of **8 hours in the lab** each week.*

Scope of the Project :

MOFs are hybrid materials that are crystalline, and contain both metal ions and organic molecules. MOFs are extremely light, have the highest known surface area, are porous, and their architectures may be tailored for a variety of uses. MOFs may be specially crafted to adsorb particular pollutants from wastewaters. As a result, they are ideal for effective separation processes. Textile industry has been one of the main polluters of water resources due to its use of extensive amounts of chemicals and water. According to some sources, an average-sized textile business uses 1.6 million liters of water each day to produce 8000 kg of cloth. According to the World Bank, the dyeing and finishing processes applied account for 17% to 20% of the water pollution caused by the textile sector. Most of the hazardous compounds found in the textile industry wastewaters cannot be eliminated by conventional wastewater treatment techniques. Therefore, novel textile wastewater treatment technologies should be developed to reduce the emission of hazardous compounds into the receiving environment, and to minimize their potential risks to the ecological environment, and human beings. This work focuses on the effectiveness of adsorptive removal of dye from textile industry wastewaters using Zr-MOF.

Hardware/Software/Lab/Equipment Requirements :

UV-Vis spectrophotometer, XRD, SEM, FTIR, zeta potential, sonicator, thermostated shaker, pH meter, analytical balance.

Development Plan :

- Literature search on the subject to have a better understanding of adsorptive removal of dye, and MOF production.
- Production of Zr-MOF.
- Characterization of Zr-MOF (Zeta Potential, XRD, SEM, FTIR).
- Batch adsorption experiments.
- Regeneration of the adsorbent.
- Data analysis, and preparation of a poster presentation, and a written report.