MARMARA UNIVERSITY
FACULTY OF ENGINEERING
ENVIRONMENTAL ENGINEERING DEPARTMENT

ENVE 4197/4198 ENGINEERING PROJECT PROPOSAL FORM FALL 2024

Instructor : Zehra Semra Can

Project Title : Treatment of dye contamination through metal–organic framework (MOF) based materials

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 :

Water pollution from dyes is a growing environmental concern since many synthetic dyes have been linked to cancer in both people and aquatic life. Adsorption is a widely used method for removing and separating dyes from wastewater. However, the conventional adsorbents are not very efficient for dye removal. The purpose of metal-organic frameworks, or MOFs, is to address these drawbacks. The remarkable dye removal and degradation capabilities of MOFs are attributed to their multipurpose nature, water-stability, large surface area, customizable pore size, and recyclable nature. For several adsorption-desorption cycles in a row, MOFs perform remarkably well. This work will focus on the effectiveness of adsorptive removal of dye from aqueous solutions using different MOFs.

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 different types of MOFs.
- Characterization of MOFs (Zeta Potential, XRD, SEM, FTIR).
- Batch adsorption experiments.
- Regeneration of the adsorbent.
- Data analysis, and preparation of a poster presentation, and a written report.