MARMARA UNIVERSITY
FACULTY OF ENGINEERING
ENVIRONMENTAL ENGINEERING DEPARTMENT

ENVE 4197/4198 ENGINEERING PROJECT
PROPOSAL FORM
FALL 2023-2024

Instructor : Dr. Aslıhan Kerç

Project Title: Application of Circular Economy Concept for Sustainable Agriculture and Source Recovery from Wastewater

Proposal No. : (AslihanKerc-*1*)

Number of Students: 2-3

Requirements (from students) : Familiar with computer models and data processing

Scope of the Project:
In the recent decades wastewater is no longer considered only as a pollution source, but rather an important water, nutrient and energy resource. Reuse of treated wastewater for agricultural irrigation is also essential to combat the adverse effects of climate change on fresh water resources. Increased and repetitive agricultural activities have also adverse effects on the soil quality. Organic content and nutrients (N, P, K) are decreasing and for better agricultural productivity nutrients are added as fertilizers from the outside; increasing the cost of agriculture. As "circular economy" concept is based on the recovery of resources and using them repeatedly in different sectors, this study is aiming to combine sustainable agriculture and source recovery from wastewater. Cost calculations will be made for evaluation of nutrient recovery, water reclamation and reuse. The fertilizer consumptions, fertilizer cost will be analyzed for the comparison of resource recovery scenarios. Literature will be reviewed for existing models on circular economy and a simple model will be developed for the application of circular economy using the open source agricultural data and wastewater data from Türkiye.

Hardware/Software/Lab/Equipment Requirements :
Powerful Computer

Development Plan: - Literature review for Circular Economy Concept, learning the basics of circular economy

- **Literature review for source recovery from wastewater**
- **Literature review for existing computer models**
- **Collect agricultural data and wastewater data from Türkiye**
- **Develop a model to calculate the resource recovery potential in line with circular economy concept.**