



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

**ENVE 497/498 SENIOR DESIGN PROJECT
PROPOSAL FORM
FALL 2017**

Instructor : Prof. Dr. Barış Çallı – R. Önder Sürmeli

Project Title : Valorization of the nutrients in the liquid fraction of biogas digestate

Proposal No. : *BarışÇallı2017-1*

Number of Students : 4

Requirements (from students) : Enve 302 'Environmental Engineering Unit Processes' course

Scope of the Project :

The purpose of the proposed project is to investigate the recovery of the nutrients from the liquid fraction of the digestate of a chicken manure digester using a hybrid process consisting of membrane separation, stripping, precipitation and/or ion exchange technologies. The liquid fraction of the digestate will be characterized physically and chemically before and after nutrient separation. Finally, the direct land application and discharge to municipal wastewater collection system options will be evaluated for the management of the remaining digestate liquor.

Hardware/Software/Lab/Equipment Requirements :

Spectrofotometre, Magnetic stirrer, Incubator, Peristaltic pumps, Portable Multimetre, HPLC (Uv detector), GC-FID, GC-TCD.

Development Plan :

- 1- Operation of an anaerobic digester
- 2- Collection of the digestate
- 3- Separation of the liquid fraction from the digestate
- 4- Application of different nutrient recovery methods
- 5- Characterization of the raw and nutrient recovered liquid digestate