**MARMARA UNIVERSITY**

**FACULTY OF ENGINEERING**

**ENVIRONMENTAL ENGINEERING DEPARTMENT**

**ENVE 4197/4198 ENGINEERING PROJECT**

**PROPOSAL FORM**

**FALL 2022-2023**

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| **Instructor : Assoc. Prof. Bilge Alpaslan Kocamemi****Project Title: Kinetic Analysis of a High Rate Activated Sludge (A Process) and Anammox (B Process) Pilot System****Number of Students :** 3 |
| **Scope of the Project :**This study aims to evaluate process removal rates in and major kinetic constants (e.g., maximum removal rates, half saturation constants of microbial species (e.g. ordinary heterotrophs, facultative heterotrophs, nitrifiers, Anammox and Comammox species) through batch experiments in parallel to the operation of A-B pilot plant. The tests will be performed in l L active volume reactors equipped with mechanical stirrer, pH, T, DO, probes and N2 gas pressure transducer. All batch experiments will be carried out under pH range of 7 –7.3, wastewater temperature range of 21 – 25 o C conditions.A stage (High Rate Activated Sludge) batch experiments will be done with suspended culture to be withdrawn from A-stage of the pilot system and will base on oxygen utilization rate (with and without ATU) and/or substrate (COD) utilization rate experiments. COD fractionation will be done through these experiments. B stage (hybrid IFAS) batch experiments will be done with (i)biomass attached carriers taken from the pilot reactor, (ii) suspended culture taken from the bulk liquid of the pilot reactor, (iii) combined attached carrier and bulk suspended culture. B-stage batch experiments will base on oxygen utilization rate (with and without ATU), substrate (TKN utilization rate, product (NO3--N, N2) formation rate measurements.  |
| **Hardware/Software/Lab/Equipment Requirements:*** Magnetic stirrer (Heidolph MR Hei standart)
* Air pump (Risheng RS-200)
* DO, pH probes, temperature transmitter (Hach, Multi parameter)
* Pressure Transducer
* Dual injection (cation and anion) ion chromotograph (Schimadzu SIL-10AP)
* Peristaltic pumps (Prodoz PRS-7)
* Timers (Timer, Ledx)
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| **Development Plan:** The thesis will be managed according to the work schedule below. At the end of this thesis, it is expected to have experience about literature searching, laboratory experiments, data analysis. time management, thesis writing, presentation and teamwork. **Work - Time Table**

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| **Work** | **Time period (month)** |
| Literature search, Training for reactors operation  | 2 |
| Batch kinetic experiments, Data Analysis  | 6 |
| Thesis writing | 1 |

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