ENE 809- Wastewater Treatment and Design

Credit Hours: 3
Pre-requisites: Nil

Course Description

Wastewater Treatment and Design provides an in-depth introduction to wastewater quality and analytical techniques of measuring pollutant concentrations. The courses provide the fundamentals of biological treatment, including microbial metabolism, bacterial growth, and microbial growth kinetics. It also provides information on the modeling of suspended and attached growth treatment processes. Lastly, the course introduces the design of an activated sludge process for domestic wastewater treatment.

Course Contents

Wastewater Treatment Overview and Constituents: Overview of the wastewater treatment types, level of treatment and raw/treated water constituents and their prescribed limits.

Biological Wastewater Treatment: Biological processes for wastewater treatment, Suspended and Attached Growth Processes and applied technologies.

Nutrient Removal Mechanisms: Background to Nitrification and Denitrification and methods of treatment, biological phosphorus removal mechanisms and processes

Wastewater Treatment Plant Design: Activated Sludge Process Description, Design parameters, kinetic coefficients, and design formulas, along with examples of design.

Recommended Reading (including Textbooks and Reference books)

- Metcalf & Eddy, G. Tchobanoglous, H.D. Stensel, R. Tsuchihashi, F. Burton (2013). Wastewater Engineering: Treatment and Resource Recovery (5th Ed.), McGraw-Hill Education.
- C. P. Leslie Grady Jr., G.T. Daigger, N.G. Love, C.D.M. Filipe (2011), Biological Wastewater Treatment (3rd Ed.). CRC Press.