

Course Code	Course Title	Credit Hours
ENE-809	Wastewater Treatment and Design	3 (3+0)

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 modeling of suspended and attached growth treatment processes. Lastly, the course introduces design of activated sludge process for domestic wastewater treatment.

Course Outline

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.

Nutrients 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 Books

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