

415.706 Advanced Environmental Hydraulics

Instructor: Seo, Il Won (38-416)

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Description:

This course deals with the analysis and prediction of the dispersion and transport phenomena of various pollutants introduced into water environmental system. In the course, fundamental theory and analytical methods for the diffusion and dispersion of the substance are discussed. Mixing characteristics and practical problems in real streams and estuaries are also covered. In the latter part of the course, transport modeling is introduced. Fundamental theory of jets and plumes are also discussed and then design of ocean outfall structures is studied.

Text:

1. Fischer, et al., 1979, *Mixing in Inland and Coastal Waters*, Academic Press, New York, N.Y.

Reference:

1. Crank, J., 1975, *The Mathematics of Diffusion*, 2nd Ed., Oxford Science.
2. Fischer, H.B. ed., 1979, *Transport Models for Inland and Coastal Waters*, Academic Press, New York, N.Y.
3. Thomann, R.V. and Mueller, J.A., 1987, *Principles of Surface Water Quality Modeling & Control*, Harper & Row.
4. Rutherford, J.C., 1994, *River Mixing*, John Wiley & Sons.

Prerequisites:

Hydraulics and Lab., Fluid Dynamics

Contents:

1. Introduction to Environmental Hydraulics
2. Diffusion Process and Solutions
3. Turbulent Transport

4. Dispersion Process
5. Mixing in Rivers
6. Dispersion of Decaying Substances

Grade:

Homework Assignments	30%
Final Exam.	40%
Term Project	30%