

457.560 Advanced Environmental Hydraulics

II. Theory of Turbulent Jets (난류제트이론)

Instructor: Seo, Il Won (35-310)

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Description:

This course deals with the motion of water related to the environmental problems caused by the human activities in water environments. In the first part of this course, fundamental theory on mechanics and mixing of turbulent buoyant jets are discussed in detail. In the latter part of the course, design technology and analysis method for the ocean outfall systems as the optimal measure for wastewater and heated water discharges. Mathematical and numerical models for analysis of dispersion of pollutants and mixing of turbulent buoyant jets are presented, and analytical and numerical methods are also discussed.

Text:

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

Reference:

1. Daily, J.W. and Harleman, D.R.F., 1966, Fluid Dynamics, Addison-Wesley.
2. Rajaratnam, N., 1976, Turbulent Jets, Elsevier Scientific Pub. Co.
3. Wood, I.R., Bell, R.G., and Wilkinson, D.L., 1993, Ocean Disposal of Wastewater, World Scientific Pub. Co., Singapore.
4. Davies, P.A., and Valente Neves, M.J., 1994, Recent Research Advances in the Fluid Mechanics of Turbulent Jets and Plumes, Kluwer Academic Press, Dordrecht, The Netherlands.

Prerequisites:

Hydraulics and Lab., Fluid Dynamics

Contents:

1. Fundamentals of Turbulent Jets
2. Mechanics of Turbulent Jets and Plumes
3. Design of Ocean Wastewater Outfall Systems
4. Design of Thermal Diffusers
5. Numerical Models for Buoyant Jets

Grade:

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