



Course Name:

Process Principles in Environmental Engineering

Course Number: 20-644	Credit: 3
Program: Graduate	Course Type: Technical Required
Prerequisite: -	Corequisite: -

Course Description (Objectives):

The objective of this course is to understand fundamental processes responsible for mixing and mass transport in the environment, and introduce their implications for important applications in natural and engineered environmental systems.

Course Content (outline):

- Chapter 1: Basic Concepts
- Chapter 2: Basic Environmental Chemistry
- Chapter 3: Mixing and Mass Transport Processes
- Chapter 4: Mixing in Inland and Coastal Waters
- Chapter 5: Air-Water Exchange
- Chapter 6: Sediment-Water Interface
- Chapter 7: Fundamentals of Physical Water Treatment Processes
- Chapter 8: Filtration and Mass Transport in Porous Media
- Chapter 9: Chemical and Biological Processes
- Appendix A: Mass Transport Equation of *E. coli*
- Appendix B: Modeling the Transport of Coliphages

References:

- “Surface water-quality modeling”, Chapra, S. C., Waveland Press (Reissued), Long Grove, 2008.
- “Transport Modeling for Environmental Engineers and Scientists”, Clark, M.M., John Wiley & Sons, 2nd Ed., New York, 2009.
- “Chemical Fate and Transport in the Environment”, Hemond, H.F., and Fechner-Levy, E.J., Academic Press, 3rd Ed., London, 2015.
- “Environmental Systems and Processes: Principles, Modeling, and Design”, Weber, W.J., Jr., John Wiley & Sons, New York, 2000.
- “Mixing in Inland and Coastal Waters”, Fischer, H.B., List, E.J., Koh, R.C.Y., Imberger, J., Brooks, N.H., Academic Press, San Diego, 1979.