



MARMARA UNIVERSITY
Faculty of Engineering
Environmental Engineering Department

SPRING 2014

A. COURSE DESCRIPTION

Course Code: ENVE 301 **Course Name:** Environmental Eng. Unit Operations

Course Description: The course examines the fundamental theory of unit operations in the physical and chemical treatment of water. Coagulation and flocculation, sedimentation, filtration, and gas transfer are among topics to be considered.

Prerequisites: ENVE 202

Instructor: Assist. Prof. A. Evren Tugtas – (email: evren.tugtas@marmara.edu.tr)

Reference Books:

- 1) Reynolds, T. D., and P. A. Richards. *Unit Operations and Processes in Environmental Engineering*. 2nd ed. Boston, MA: PWS Publishing Company, 1996. ISBN: 0534948847. (**Textbook**)
- 2) Geankoplis C.J. *Transport Processes and Separation Process Principles*. 4th ed. New Jersey. Prentice Hall. 2003. ISBN: 0-13-101367-X
- 3) American Water Works Association. *Water Quality and Treatment: A handbook of community water supplies*. 5th ed. McGraw Hill, 1999 ISBN: 0-0070016593

B. COURSE CONTENT

1. Introduction to water and wastewater treatment
2. Reaction Kinetics, Mass Balances, and Reactor Types
3. Gas Transfer
4. Gas Transfer and Aeration
5. Cascade Aeration
6. Mixing
7. Coagulation & Flocculation
8. Coagulants
9. Coagulation&Flocculation Design
10. Sedimentation
11. High Rate Settlers & Solids Handling
12. Filtration



C. GRADING POLICY

Quizzes: 10%
Projects: 20%
Midterm I: 15%
Midterm II: 15%
Final: 40 %

Regular attendance and class participation will be considered in assigning final grades.
Homework solutions will be posted one week after graded homework is returned.