

WATER QUALITY ENGINEERING

Instructor: S.W. Hermanowicz, 629 Davis Hall
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Format: 3 hours of lecture per week

Description: Principles and engineering applications of technical processes for water and wastewater treatment, and water reclamation: separation and transformation technologies (sedimentation, membrane processes, oxidation, biodegradation, activated sludge, biofilm reactors, biological treatment of drinking water, solids processing, disinfection). Application of fundamental principles for process analysis and design with a focus on commonalities in applications across industry. Regulatory process and drivers.

Recommended Text: Wastewater engineering : treatment and reuse, Metcalf & Eddy 4th ed., McGraw-Hill, 2003 UCB Engin TD645 .W293 2003

Water treatment principles and design, MWH, 2nd ed., Wiley, 2005
UCB Engin TD430 .W375 2005.

Reference Readings:

Design of Municipal Wastewater Treatment Plants. Water Environment Federation Manual of Practice No. 8, ASCE Manual and Report of Engineering Practice No. 76. Volumes 1 and 2., 1992

Process design manual for sludge treatment and disposal. [Rev. ed].. [Cincinnati : U.S. Environmental Protection Agency, Municipal Environmental Research Laboratory, Office of Research and Development, Center for Environmental Research Information, Technology Transfer, 1979- UCB Engin TD768 .P76 1979

Activated sludge process design and control : theory and practice / edited by W. Wesley Eckenfelder, Petr Grau. Lancaster, PA, : Technomic Pub. Co., 1992. Engin TD756 .A3 1992

As a rule, **homework** will be assigned each week and will be due by 5 p.m. one week from the day it is handed out. No late exceptions.

Each student is expected to review and present a technical paper or report on a topic related to the class.

Grading: Homework - 35%, Midterm - 20%, Presentation - 15%, Final Exam - 30%

OUTLINE

Week	Topic
1	Water quality. Treatment goals. Regulations. Flow and load analysis. Process Design: Criteria, reliability
2	Separation Technologies: Sedimentation
3	Separation Technologies: Coagulation/Flocculation
4	Separation Technologies: Coagulation/Flocculation
5	Separation Technologies: Filtration
6	
7	Separation Technologies: Membrane Processes, MBR
8	
9	Transformation Technologies: Chemical Oxidation, Disinfection
10	Water Business and Industry Overview. Transformation Technologies: Microbial Communities
11	SPRING BREAK
12	Transformation Technologies: Biological Processes - Activated Sludge
13	Process Control. Nutrient Control.
14	Transformation Technologies: Biofilm Reactors, Biological Filters,
15	Biological Processes for Drinking Water
16	Transformation Technologies: Anaerobic Treatment
17	