

# Bemidji State University

## ENVR 4200: Wastewater Treatment

### A. COURSE DESCRIPTION

Credits: 3

Lecture Hours/Week: \*.\*

Lab Hours/Week: \*.\*

OJT Hours/Week: \*.\*

Prerequisites: None

Corequisites: None

MnTC Goals: None

Introduction to the operation of the principal methods and treatment processes of municipal and industrial wastewaters, and for the disposal of treated effluent and sludges, and other solid materials. Integration of fundamental principles of science with different aspects of sanitary technology. Prerequisites: BIOL 1212, CHEM 1112 or CHEM 2212, MATH 1170, or consent of instructor. BIOL 1212 is not required for Chemistry majors.

**B. COURSE EFFECTIVE DATES:** 08/21/1997 - Present

### C. OUTLINE OF MAJOR CONTENT AREAS

1. Activated Sludge System
2. Aeration and Gas Transfer
3. Biological Treatment
4. Biology of Wastewater
5. Characteristics of Municipal Sewage
6. Chemical Destruction and Detoxification
7. Chemical Precipitation
8. Chemistry of Wastewater
9. Disinfection
10. Examination of Water & Wastewater
11. Industrial Waste Water Treatment
12. Laboratory Chemical Analysis
13. Lagoon Systems
14. Pretreatment and Primary Treatment
15. Sewage and Industrial Wastewater Characterization
16. Sludge Treatment and Anaerobic Processes
17. Stabilization and Ion Exchange
18. Tertiary Treatment
19. Trickling Filters
20. Water Processing
21. Water Quality Objectives and Standards

**D. LEARNING OUTCOMES (General)**

1. apply scientific reasoning (in chemistry, biology, and physics) and quantitative methods to treat municipal and industrial wastewater and safely dispose of sludge and reuse treated effluent.
2. demonstrate good communication and problem solving ability.
3. attain higher learning in wastewater treatment technology.

**E. Minnesota Transfer Curriculum Goal Area(s) and Competencies**

None

**F. LEARNER OUTCOMES ASSESSMENT**

As noted on course syllabus

**G. SPECIAL INFORMATION**

None noted