

CIV 320 - Water and Wastewater Treatment Plant Design

Current Catalog Description: This course will cover the planning, design, and operation of water and wastewater infrastructure. Specific topics include: water and wastewater planning; environmental laws and regulations; water quality; physical water and wastewater treatment processes; chemical water and wastewater treatment processes; biological wastewater treatment processes; mass, material and energy balances; economics and financial calculations; resiliency and sustainability.

Prerequisite: CIV 364 or MEC 364; CIV major

Corequisite: None

Textbooks and/or Other Required Material: Required Texts:
Viessman, Jr., W. et al., Water Supply and Pollution Control, 8th Edition, Prentice Hall, Upper Saddle River, New Jersey, 2009.

This course is: Required

- Topics Covered:**
1. Local and Global Water Issues
 - a. Environmental Regulations
 - b. Watershed Management
 2. Hydrologic cycle
 - a. Urban Water cycle
 - b. GroundWater Wells
 - c. Well Hydraulic
 3. Surface Water Reservations
 - a. Reservoir Storage Calculations
 - b. Water use Trends and Forecasting
 - c. Population Forecasting
 4. Overview of Water Quality
 5. Water Supply
 - a. Oxygen Demand
 - b. Sewage Impacts on Streams
 - c. Mixing and Flocculation
 - d. Sedimentation; filtration
 6. Wastewater treatment design
 - a. Biological Treatment Systems
 - b. Biological Considerations
 - c. Wastewater Characteristics

Course Learning and Student Outcomes:	Course Learning Objectives	ABET Student Outcomes
	apply knowledge of physics, chemistry, and biology to understand water quality issues	1
	identify appropriate regulations governing water quality and the design of a particular engineering design	6, 7
	solve problems related to water supply and treatment	6
	solve problems related to wastewater collection and treatment	6
	function effectively as a member of a team to develop and write a preliminary design report	3, 5

Prepared by: Xinwei Mao (2021)