

College of Engineering

Department of Civil Engineering

جامعة  
الملك سعود  
King Saud University



## CE 443 Water and Wastewater Lab

**Credit and  
Contact hours**

1/ 0 (Lectures), 0 (Tutorials), 2 (Laboratory)

**Required, or  
Elective**

Required for a BSCE degree

**Course  
Description**

Laboratory experiments related to water and wastewater quality testing. Recognizing the technical aspects of water and wastewater testing, with the identification of the necessary test for water and wastewater monitoring. Practical sample testing for the most common water and wastewater quality parameters.

**Prerequisites or  
Co-requisites**

**Prerequisites:** Engineering and Environment GE (203) and Hydraulics (CE 324)  
**Co-requisites:** Water and Wastewater Treatment (CE 448)

**Course Learning  
Outcomes**

Students completing this course successfully will be able to

Course Learning Outcomes	Related Student Outcomes (SO)
<b>CLO1.</b> Conduct appropriate experimentation on water and wastewater samples using standard procedures to, identify concentration of different water and wastewater parameters	<b>SO6</b>
<b>CLO2.</b> Analyze water and wastewater samples for the most common parameters to draw conclusion on its acceptability to regulatory agencies for its reuse.	<b>SO6</b>
<b>CLO3.</b> Evaluate the quality and reporting procedures for water and wastewater samples, as well as analysis results and compare it with the environmental standards (through a project)	<b>SO4</b>

**Student Outcomes  
related to this  
Course**

**SO4.** an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts. [ABET 4]

	<b>SO6.</b> an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions. [ABET 6]	
<b>Topics Covered</b>	<b>List of Topics</b>	
	1. Course introduction and laboratory safety	CLO1
	2. Water quality, drinking water standards and wastewater disposal and reuse criteria	CLO1
	3. Measurement of pH, Alkalinity, Turbidity, and Conductivity	CLO1
	4. Measurement of Hardness	CLO2
	5. Measurement of Chlorides	CLO2
	6. Measurement of Sulfates, Total Dissolved Solids, Suspended Solids, Total Solids	CLO2
	7. Measuring the optimum dosage of coagulant for coagulation and flocculation processes	CLO2
	8. Measurement of Total and Fecal Coliform	CLO2
	9. Measurement of Chlorine Demand and Residual Chlorine	CLO2
	10. Measurement of Biochemical Oxygen Demand	CLO2
	11. Measurement of Chemical Oxygen Demand	CLO2
	12. Measurement of Ammonia-Nitrogen	CLO2
	13. Measurement of Total Phosphorus	CLO2
14. Group Project – Procedures and Quality control in water & wastewater sample analysis	CLO3	
<b>Textbook(s) and Other Required Material</b>	Hammer, M. J. Sr. and Hammer, M. J. Jr. “Water and Wastewater Technology. 6th Edition, Prentice Hall, 2007.	
<b>Grading System</b>	Two Mid-term exams	40 %
	Laboratory Reports	30%
	Participation	10%
	Final Exam:	20%
<b>Instructors</b>	Dr. Mohamed Abdelhalim Othman (2A94), email; <a href="mailto:maothman@ksu.edu.sa">maothman@ksu.edu.sa</a>	
<b>Date of Review</b>	October, 2020	