

<b>Course</b>	CE 36600 – Environmental Engineering Laboratory
<b>Type of Course</b>	Required for Civil Engineering Program
<b>Catalog Description</b>	Application of basic chemistry and chemical calculations to measure physical, chemical, and bacteriological parameters of water and wastewater. Laboratory methods and interpretation of results with regard to environmental engineering applications such as design and operation of water and wastewater treatment processes, and to the control of the quality of natural water.
<b>Credits</b>	1
<b>Prerequisite Courses</b>	CE 36500 – Environmental Engineering
<b>Contact Hours</b>	3
<b>Corequisite Courses</b>	None
<b>Prerequisites by Topics</b>	Fundamental knowledge of Environmental Engineering
<b>Textbook and Other Supplemental Materials</b>	No text book is required for this course. Laboratorial sheets will be prepared based on the Standard Methods for Examination of Water and Wastewater and distributed in the class.
<b>Course Objectives</b>	<p>To introduce students to how the common environmental experiments relating to water and wastewater quality are performed.</p> <p>This course will help students know which tests are appropriate for given environmental problems, statistically interpret laboratorial results and write technical reports, and apply the laboratorial results to problem identification, quantification, and basic environmental design and technical solutions.</p>
<b>Course Outcomes</b>	<p>Students who successfully complete this course will be able to:</p> <ol style="list-style-type: none"><li>1. Perform common environmental experiments relating to water and wastewater quality, and know which tests are appropriate for given environmental problems. [1,6]</li><li>2. Statistically analyze and interpret laboratorial results. [6]</li><li>3. Apply the laboratorial results to problem identification, quantification, and basic environmental design and technical solutions. [1]</li></ol>

4. Understand and use the water and wastewater sampling procedures and sample preservations. [2]
5. Obtain the necessary background for subsequent courses in environmental engineering. [7]
6. Demonstrate the ability to write clear technical laboratorial reports. [3]
7. Use word processors and other modern software packages in writing and finishing the reports. [3]
8. Demonstrate the ability to work in groups. [5]
9. Understand the impact of water and wastewater treatment on people and the environment. [4]
10. Understand and apply ethical issues associated with decision making and professional conduct in the laboratorial and field environment. [4]

**Lecture Topics**

1. Orientation, introduction, lab safety, sampling techniques and sample preservation
2. Determination of pH of Water
3. Determination of Color of Water
4. Determination of Turbidity of Water
5. Determination of Solids in Water
6. Determination of Acidity in Water
7. Determination of Alkalinity of Water
8. Determination of Hardness of Water
9. Determination of Alum Dose (Alum Coagulation)
10. Determination of Chloride in Water
11. Determination of Metal (Iron or Arsenic) in Water
12. Determination of Biochemical Oxygen Demand
13. Determination of Chemical Oxygen Demand
14. Determination of Break Point Chlorination

**Computer Usage**

Medium

**Laboratory Experience**

High

**Design Experience**

Medium

**Coordinator**

Dong Chen, Ph.D., P.E.

**Date**

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