

CE 443
Water and Wastewater Laboratory

Department of Civil Engineering
King Saud University

<p>Course Description: CE 443 Water and Wastewater Laboratory (Required for a BScE degree)</p>	<p>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. 1(0,0,2)</p>
<p>Requisites</p>	<p>Prerequisite: CE 324 (Hydraulics); GE 302 (Industry and Environment); Co-requisite: CE 448 (Water and Wastewater Treatment).</p>
<p>Course Learning Objectives</p>	<p>After completing this course successfully, the student should:</p> <ol style="list-style-type: none"> 1. Recognize the technical aspects of water and wastewater samples testing. 2. Identify the type of testing that should be carried out on water and wastewater sample. 3. Collect, preserve, and analyze water and wastewater sample for the most common parameters in a manner acceptable to regulatory agencies. 4. Implement basic quality control and reporting procedures.
<p>Topics Covered</p>	<ul style="list-style-type: none"> ○ Course introduction and laboratory safety (1 hours) ○ Water Sources and Quality, Drinking Water Standards and Wastewater Disposal and Reuse Criteria (3 hours) ○ pH, Alkalinity, Turbidity, and Conductivity (2 hours) ○ Hardness and Chlorides (2 hours) ○ Sulfates, Total Dissolved Solids, Suspended Solids, Total Solids (2 hours) ○ Coagulation & Flocculation. (2 hours) ○ Total and Fecal Coliform (2 hours) ○ Chlorine Demand and Residual Chlorine (2 hours) ○ Biochemical Oxygen Demand (2 hours) ○ Chemical Oxygen Demand (2 hours) ○ Ammonia-Nitrogen (2 hours) ○ Total Phosphorus (2 hours)
<p>Class Schedule</p>	<p>The laboratory is held once a week in a 2-hr session.</p>
<p>Contribution of Course to Meeting the Professional Component</p>	<ul style="list-style-type: none"> ○ The course enables students to design and conduct experiments related to water and wastewater quantity and quality control, and analyses and interpret results. ○ The course enhances the student's ability to articulate ideas clearly in written and verbal forms.

Relationship of Course to Program Outcomes	<p>This course will allow students to:</p> <ul style="list-style-type: none"> ○ Utilize knowledge of mathematics, chemistry, physics, and microbiology to understand the characteristics of water and wastewater and the principles of processing of water and wastewater. ○ Conduct laboratory experiments related to water and wastewater quality and process design. ○ Write reports on laboratory experiments to present, interpret and discuss results and make sound conclusions.
Textbook(s) and other Required Material	<ul style="list-style-type: none"> ○ Hammer, M. J. and Hammer, M. J. Jr. "Water and Wastewater Technology" 5th Edition in SI Units, Pearson Education South Asia Pte Ltd., Singapore (2005). ○ APHA, AWWA, and WEF. "Standard Methods for the Examination of Water and Wastewater", 20th edition, APHA, Washington, DC. (1998).
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Revised by	Dr. Mohamed Othman; 05-May-2016 Dr. Mohamed Othman; 27-Mar-2017

Grade Distribution

Attendance, participation, and quizzes	10%
Laboratory Reports	30%
Mid-term Exam - Theory	20%
Final Exam - Theory	20%
Final Exam - Practical	20%

Homework and Reports

The Laboratory Reports must be done independently and submitted on time. Late submission will be penalized. Submission must be neat and clean on A4 paper.