

CE 443

Water and Wastewater Laboratory

Department of Civil Engineering

King Saud University

Course Description: CE 443 Water and Wastewater Laboratory (Required for a BScE degree)	Laboratory experiments related to water and wastewater quality and quality control. Understanding drinking water standards. Wastewater reuse and disposal criteria. 1(0,0,2)
Requisites	Prerequisite: CE 324 (Hydraulics); GE 302 (Industry and Environment); Co-requisite: CE 448 (Water and Waste Water Treatment).
Course Learning Objectives	<ol style="list-style-type: none">1. Measure different physical, chemical, and microbiological quality parameters of water and wastewater.2. Conduct laboratory experiments to determine chemical requirements and assess performance aspects for different water and wastewater processing means.
Topics Covered	<ol style="list-style-type: none">1. Water Quality Parameters and Measurements (8 hours)2. Water Sources and Quality, Drinking Water Standards and Wastewater Disposal and Reuse Criteria (2 hours).3. pH – Alkalinity – Turbidity _ Conductivity. (2 hours)4. Hardness – Chlorides. (2 hours)5. Sulphates – Total Dissolved Solids (TDS) – Suspended Solids (SS) – Total Solids (TS). (2 hours)6. Coagulation & Flocculation. (2 hours)7. Microbiological (Total and Fecal Coliform). (2 hours)8. Chlorine Demand and Residual Chlorine. (2 hours)9. Biochemical Oxygen Demand (BOD). (2 hours)10. Chemical Oxygen Demand (COD). (2 hours)11. Ammonia (NH₃-N). (2 hours)
Class Schedule	Laboratory is held once a week in a 2-hr session.
Contribution of Course to Meeting the Professional Component	<ol style="list-style-type: none">1. The course enables students to design and conduct experiments related to water and wastewater quantity and quality control, and analyse and interpret results.2. The course enhances the student ability to articulate ideas clearly in written and verbal forms.

Relationship of Course to Program Outcomes	<p>This course will allow students to:</p> <ol style="list-style-type: none"> 1. Utilize knowledge in mathematics, chemistry, physics, and microbiology to understand the characteristics of water and wastewater and the principles of processing of water and wastewater. 2. Conduct laboratory experiments related to water and wastewater quality and process design. 3. Write reports on laboratory experiments to present, interpret and discuss results and make sound conclusions.
Textbook(s) and/or Other Required Material	<ol style="list-style-type: none"> 1. 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). 2. APHA, AWWA, and WEF. "Standard Methods for the Examination of Water and Wastewater", 20th edition, APHA, Washington, DC. (1998).
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Date of Preparation	Oct 10, 2012

Grade Distribution

Mid-term Exam	20%
Laboratory Reports	40%
Final Exam	40%

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.