

College of Engineering

Department of Civil Engineering

جامعة
الملك سعود
King Saud University



CE 508 Physicochemical Treatment Processes

Credit and Contact hours	3/ 3 (Lectures), 0 (Tutorials), 0 (Laboratory)	
Required, or Elective	Required for a MSCE degree	
Course Description	Fundamentals of process kinetics and reactor engineering. Aeration and gas transfer, coagulation and flocculation, sedimentation, filtration, and disinfection. Adsorption, ion exchange and membrane processes. Chemical sludge treatment and handling.	
Prerequisites or Co-requisites	1- The course draws on knowledge of chemistry, physics and integral and differential calculus. 2- Under graduate course: CE 448 Water and Wastewater Treatment 3- Under graduate course: CE 443 Water and Wastewater Laboratory	
Course Learning Outcomes	Students completing this course successfully will be able to	
	Course Learning Outcomes	Related Program Outcomes
	CLO1: Review basic engineering principles for Water Quality Parameters - Physical and chemical properties of targeted pollutants and reaction kinetics	K1
	CLO2: Learn aeration, sedimentation, coagulation and flocculation processes. Able to explain settling equations. Tube settlers and pulsators.	K1
	CLO3: Design filter units along with filter backwash system. Analyze chemistry of disinfection and to know the kinetics of disinfection. Understand adsorption process and apply the knowledge of isotherms.	C2
	CLO4: Learn and design various miscellaneous treatment processes such as Ion Exchange-processes, Application of Membrane Processes, Reverse Osmosis, Micro-filtration, Nano-filtration, Ultrafiltration and Electrodialysis.	C2
CLO5: Learn knowledge about generation of chemical sludge and its management. Design sludge dewatering and disposal process in real-life projects and evaluate its effectiveness.	S1	

