

1.	Title of the course	Chemical Processes for Environmental Engineering
2.	Course number	CE504L
3.	Structure of credits	3-0-0-3
4.	Offered to	PG
5.	New course/modification to	Modification To CE5111/3
6.	To be offered by	Department of Civil and Environmental Engineering
7.	To take effect from	July 2022
8.	Prerequisite	CoT
9.	Course Objective(s): 1. To introduce the basic concepts in Environmental Chemistry 2. To introduce the fundamentals of common chemical processes used in water and wastewater treatment plants 3. To give a solid foundation for engineering students in aqueous Chemistry	
10.	Course Content: Basic concepts in Environmental Chemistry: Chemical equations and reactions-chemical equilibrium, chemical thermodynamics, fundamentals of acid-base equilibria, solubility equilibria, oxidation-reduction equilibria; Chemical Process in water and wastewater treatment: process kinetics - reaction rates and order, water stabilization basics of surface and colloidal chemistry, coagulation and water softening, water stabilization, ion exchange, chemical precipitation.	
11.	Textbook(s): 1. Benefield L D, Judkins J F and Weand B L, <i>Process Chemistry for Water and Wastewater Treatment</i> , Prentice – Hall, INC, New Jersey, (1982). 2. Sawyer C, McCarthy P and Parkin G, <i>Chemistry for Environmental Engineering and Science</i> , McGraw-Hill (2003).	
12.	Reference(s): 1. Metcalf and Eddy, <i>Wastewater Engineering: Treatment, Disposal and Reuse</i> , Tata McGraw-Hill (2003). 2. Stanley E. Manahan, <i>Environmental Chemistry</i> , 10th Edition, CRC Press (2017).	