

**Course Keywords	Environmental engineering, Biotechnology, Biological treatment, Resource recovery, Wastewater treatment						
*1. Goals	This class deals with the engineering methodologies to protect the human and ecosystem health from the threat of water pollution caused by human activities. Students study collection, transport, treatment, and discharge of wastewater and stormwater as well as the approaches to enhance the sustainability of human water use by recovering energy and resources from wastewater and stormwater. Based on engineering principles, the planning, design, operation, and maintenance of unit processes involved in the treatment of and energy/resource recovery from wastewater, stormwater, and residual solids are studied. Novel technologies for sustainable water use through energy and resource recovery are reviewed, and challenges and future tasks involved in the enhancement of water use sustainability are discussed.						
**2. Reading Materials	Textbooks	Handouts					
	References	Metcalf & Eddy, AECOM. Wastewater Engineering: Treatment and Resource Recovery, 5th ed., McGraw-Hill, 2015.					
**3. Course Schedule	Lecture Method	<input type="checkbox"/> Flipped learning <input checked="" type="checkbox"/> Theory-driven <input type="checkbox"/> Discussion-oriented <input checked="" type="checkbox"/> Project-based <input type="checkbox"/> Others					
	W01: Course introduction and overview W02: Physical characteristics of water / Chemical characteristics of water I W03: Chemical characteristics of water II / Biological characteristics of water W04: Case study on water quality problem / Wastewater management: Collection and masterplan W05: Wastewater treatment overview / Reaction and reactor analysis W06: Physical unit processes I, II W07: Physical unit processes III / Physical unit process case study W08: Chemical unit processes / Chemical unit process case study W09: Fundamentals of biological treatment W10: Biological nutrient removal / Practical application of biological treatment W11: Water-energy nexus / Wastewater reuse + Introduction to SNU-EnvironEngGroup W12: Decentralized wastewater systems / Final review W13: Final exam / SNU-EnvironEngGroup labtour W14: Team project discussion W15: Team project presentation						
*4. Evaluation	Grading Method	Absolute evaluation					
	Grading Type	A~F (can opt for S/U)					
	Item	Attendance	Assignment	Final	Quizzes	Other	Total
	Rate	10	15	40	10	25	100%
	Note				Every class	Team project	
Attendance Policy	Students who are absent more than 1/3 of class days will receive "F" or "U" grade. Students whose attendance is acknowledged can be exceptions. (Academic Grading Regulations, Guidance of Attendance and Grading for Early Employed Students)						
Other	Other matters pertaining to the evaluation method such as regulations on cheating, whether and how alternative tests are made, and whether feedback for assignments or tests is provided						
5. Quota Exceeding Course Registration	Capacity	Up to 30 Students					
6. Guideline for Students	Prerequisite Courses	Environmental Engineering					
	Requirements						
	Office Hours	Mon 17:00~17:30, Fri 09:00~09:30 / via zoom (ID 867 557 3197)					
7. Support Services for Students with	For Lectures	<input type="checkbox"/> Visual Impairment: Make textbooks(digital textbook, braille textbook, enlarged textbook etc.), Allow note takers <input type="checkbox"/> Physical Disability: Make textbooks(digital textbook), Allow note takers and assistants <input type="checkbox"/> Hearing Impairment: Allow note takers and translators, Allow lecture recording <input type="checkbox"/> Health Impairment: Excuse absence due to health problems, Allow note takers <input type="checkbox"/> Learning Disability: Allow note takers <input type="checkbox"/> Intellectual Disability / Autism Spectrum Disorder: Allow note takers and mentors					

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