

**Course Keywords	Environmental engineering, Biotechnology, Biological treatment, Resource recovery, Wastewater treatment							
*1. Goals	Understand the scientific and engineering principles and practices of biological processes for the management of water, soil, and solid waste. Obtain in-depth knowledge, study current issues of research, and discuss the future research direction on the biological processes applied for the treatment of wastewater and resource recovery from organic wastes.							
**2. Reading Materials	Textbooks	Handouts						
	References	<ul style="list-style-type: none"> - Rittmann, B. E. and McCarty, P. L. (2001) Environmental Biotechnology: Principles and Applications, McGraw-Hill - Maier R. M., Pepper, I. I, and Gerba, C. P. (2008) Environmental Microbiology, 2nd ed., Academic Press-Sawyer - McCarty, P. L. and Parkin (2002) Chemistry for Environmental Engineering and Science; McGraw-Hill - Davis, M. L. and Masten, S. J. (2021) Principles of Environmental Engineering and Science, 4th ed., McGraw-Hill (Kor) 박제량, 최용주(감수) (2022) 환경공학 및 과학, 청문각 						
**3. Course Schedule	Lecture Method	<input type="checkbox"/> Flipped learning <input checked="" type="checkbox"/> Theory-driven <input checked="" type="checkbox"/> Discussion-oriented <input type="checkbox"/> Project-based <input type="checkbox"/> Others						
	W01: Introduction to biological processes in environmental engineering / Basics of microbiology W02: Biomolecules / Biochemical reactions W03: Stoichiometry of biochemical reactions I & II W04: Stoichiometry of biochemical reactions III / Microbial energetics W05: Microbial kinetics / Reactor analysis I W06: Reactor analysis II / Microbial kinetics in reactors I W07: Microbial kinetics in reactors II & III W08: Bioreactor analysis – numerical solution / Wastewater treatment overview W09: Biological wastewater treatment I & II W10: Practices of biological wastewater treatment / Anaerobic processes W11: Innovative biological wastewater treatment processes / Recalcitrant compound biotransformation mechanisms W12: Bioinformatics using metagenomics / Final review W13: Final exam W14-15: Student presentation & discussion							
*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	50	10	15	100%
		Note				Every class	Student presentation and discussion	
	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							
	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 Disabilities	For Lectures	<ul style="list-style-type: none"> ○ Visual Impairment: Make textbooks(digital textbook, braille textbook, enlarged textbook etc.), Allow note takers ○ Physical Disability: Make textbooks(digital textbook), Allow note takers and assistants ○ Hearing Impairment: Allow note takers and translators, Allow lecture 						

※ Contents can be modified as needed		recording ○ Health Impairment: Excuse absence due to health problems, Allow note takers ○ Learning Disability: Allow note takers ○ Intellectual Disability / Autism Spectrum Disorder: Allow note takers and mentors
	For Assignments & Evaluations	○ Visual Impairment / Physical Disability / Hearing Impairment / Health Impairment / Learning Disability: Extend assignment deadlines, Offer alternate assignment submission and response method, Extend testing period, Offer alternate testing method, Offer different testing room ○ Intellectual Disability / Autism Spectrum Disorder: Offer individualized assignments and alternative evaluations
	Other	Students who take this course can get appropriate level of support service including the support listed above depending on the students' individual characteristics and needs through consultation with professors and the Support Center for Students with Disabilities. If you have any questions concerning support service for students with disabilities you can contact Professor *** (02-880-****) or Support Center for Students with Disabilities (02-880-8787).

◎ Required fields when directly typing syllabus in mySNU: *, **

◎ Required fields when uploading syllabus file in mySNU: **