

## Tamkang University Academic Year 109, 1st Semester Course Syllabus

Course Title	WASTEWATER ENGINEERING	Instructor	LI, CHI-WANG
Course Class	TEWBB3A DIVISION OF ENVIRONMENTAL ENGINEERING, DEPARTMENT OF WATER RESOURCES AND ENVIRONMENTAL ENGINEERING, 3A	Details	<ul style="list-style-type: none"> <li>◆ General Course</li> <li>◆ Required</li> <li>◆ One Semester</li> </ul>
<p>Departmental Aim of Education</p>			
<p>I. Educating students with the fundamental knowledge of mathematics, science and engineering to enable them to succeed in the practice or academic research related to water resources and environmental engineering.</p> <ol style="list-style-type: none"> <li>1. Training students with engineering basics to equip them with the capabilities of construction supervision and operation management.</li> <li>2. Cultivating students with ability of applying engineering theory and pursuing innovation to equip them with the capabilities of researching, planning, engineering design, integration and assessment.</li> <li>3. Training students with capacity to apply information technology in the engineering business.</li> </ol> <p>II. Cultivating students to become professional engineers with care in environment and professional ethics.</p> <ol style="list-style-type: none"> <li>1. Cultivating students with characters of respecting the nature and humane care.</li> <li>2. Cultivating students with engineering ethics and law-abiding character.</li> <li>3. Preparing students with the capabilities of exploring, analyzing, interpreting, and dealing with problems.</li> </ol> <p>III. Preparing students with the capabilities of engaging in domestic and international engineering business.</p> <ol style="list-style-type: none"> <li>1. Cultivating students with the capabilities of project management, presentation and communication skills, and teamwork.</li> <li>2. Preparing students with the capabilities of applying professional foreign language and expanding their global perspective.</li> <li>3. Cultivating students with cognitive and habits of continuous learning.</li> </ol>			
<p>Subject Departmental core competences</p>			
<ol style="list-style-type: none"> <li>A. Basic mathematical and engineering knowledge needed for water resources and environmental engineering applications.(ratio:35.00)</li> <li>B. Capabilities of Engineering drawings, measurement, design, construction, and application of information related tools.(ratio:35.00)</li> <li>C. Capabilities of logical thinking, analysis, integration, problem-solving skills, innovative design and engineering implementation.(ratio:30.00)</li> </ol>			
<p>Subject Schoolwide essential virtues</p>			

1. A global perspective. (ratio:50.00)

5. Independent thinking. (ratio:50.00)

**Course Introduction**

In this course, following topics are discussed. Introduction of the types of sewerage systems. Quality and quantity of sewage. Design of sewer. Introduction of preliminary, primary, secondary, and advanced wastewater treatment processes. Introduction of sludge treatment processes.

**The correspondences between the course's instructional objectives and the cognitive, affective, and psychomotor objectives.**

Differentiate the various objective methods among the cognitive, affective and psychomotor domains of the course's instructional objectives.

I. Cognitive : Emphasis upon the study of various kinds of knowledge in the cognition of the course's veracity, conception, procedures, outcomes, etc.

II.Affective : Emphasis upon the study of various kinds of knowledge in the course's appeal, morals, attitude, conviction, values, etc.

III.Psychomotor: Emphasis upon the study of the course's physical activity and technical manipulation.

No.	Teaching Objectives	objective methods
1	1. Students will be able to demonstrate their understanding of the design parameters for sewer collection system and treatment processes by applying these parameters to design a sewerage system.	Cognitive

The correspondences of teaching objectives : core competences, essential virtues, teaching methods, and assessment

No.	Core Competences	Essential Virtues	Teaching Methods	Assessment
1	ABC	15	Lecture	Testing

**Course Schedule**

Week	Date	Course Contents	Note
1	109/09/14 ~ 109/09/20	Introduction of sewerage system. Quality and quantity of sewage	
2	109/09/21 ~ 109/09/27	Hydraulics review	
3	109/09/28 ~ 109/10/04	Pump and Pumping station design	

4	109/10/05 ~ 109/10/11	Sewer collection system design	
5	109/10/12 ~ 109/10/18	Sewer collection system design	1st exam
6	109/10/19 ~ 109/10/25	Preliminary and primary treatment processes	
7	109/10/26 ~ 109/11/01	Introduction of biological concepts	
8	109/11/02 ~ 109/11/08	Activated sludge treatment process	
9	109/11/09 ~ 109/11/15	Activated sludge treatment process	
10	109/11/16 ~ 109/11/22	Midterm Exam Week	
11	109/11/23 ~ 109/11/29	Oxygen transfer and mixing /Filed trip	
12	109/11/30 ~ 109/12/06	Attached growth treatment processes	
13	109/12/07 ~ 109/12/13	Attached growth treatment processes	
14	109/12/14 ~ 109/12/20	Anaerobic digestion	2nd exam
15	109/12/21 ~ 109/12/27	Aerobic digestion	
16	109/12/28 ~ 110/01/03	Advanced wastewater treatment processes	
17	110/01/04 ~ 110/01/10	Advanced wastewater treatment processes	
18	110/01/11 ~ 110/01/17	Final Exam Week	

Requirement	
Teaching Facility	Computer
Textbooks and Teaching Materials	Wastewater Engineering Treatment and Reuse, by Eddy Metcalf
References	
Number of Assignment(s)	(Filled in by assignment instructor only)
Grading Policy	<p>◆ Attendance :            %    ◆ Mark of Usual : 20.0 %    ◆ Midterm Exam : 20.0 %</p> <p>◆ Final Exam :    20.0 %</p> <p>◆ Other &lt;Two exams&gt; : 40.0 %</p>

Note

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