

## Tamkang University Academic Year 111, 2nd Semester Course Syllabus

Course Title	SLUDGE TREATMENT	Instructor	GAU SUE-HUAI
Course Class	TEWXD1A DOCTORAL PROGRAM, DEPARTMENT OF WATER RESOURCES AND ENVIRONMENTAL ENGINEERING, 1A	Details	<ul style="list-style-type: none"> <li>◆ General Course</li> <li>◆ Selective</li> <li>◆ One Semester</li> </ul>
Relevance to SDGs	<p>SDG6 Clean water and sanitation</p> <p>SDG12 Responsible consumption and production</p>		
Departmental Aim of Education			
<p>I. Cultivating students with capabilities of carrying out practical works or academic research related to water resources and environmental engineering.</p> <p>II. Cultivating students with capability of solving problems through researching, planning, and management.</p> <p>III. Cultivating students to become professional engineers with care in environment and professional ethics.</p> <p>IV. Preparing students with the capabilities of engaging in international engineering business, to adapt to globalization and social needs, and to expand their global perspectives.</p>			
Subject Departmental core competences			
<p>A. Mathematical and engineering knowledge needed for water resources and environmental engineering applications.(ratio:30.00)</p> <p>B. Capabilities of planning and conducting experiments, analyzing and explaining experimental data, applying information tool, and collecting and compiling data. (ratio:15.00)</p> <p>C. Logical thinking, analysis, integration, problem-solving skills, engineering planning, design and implementation ability.(ratio:10.00)</p> <p>D. Skill of using professional foreign language and global perspective.(ratio:30.00)</p> <p>E. Capabilities of writing and presenting research report.(ratio:10.00)</p> <p>F. Awareness of the importance of teamwork, working attitude and professional ethics, and to learn continuously.(ratio:5.00)</p>			
Subject Schoolwide essential virtues			
<p>1. A global perspective. (ratio:30.00)</p> <p>2. Information literacy. (ratio:5.00)</p> <p>3. A vision for the future. (ratio:5.00)</p>			

4. Moral integrity. (ratio:5.00)
5. Independent thinking. (ratio:15.00)
6. A cheerful attitude and healthy lifestyle. (ratio:30.00)
7. A spirit of teamwork and dedication. (ratio:5.00)
8. A sense of aesthetic appreciation. (ratio:5.00)

Course  
Introduction

Exploring on the characteristics, liquid phase treatment, solid phase treatment and recovery methods of sludge.

**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	Exploring on the characteristics of sludge.	Cognitive
2	Liquid phase sludge treatment	Cognitive
3	Solid phase sludge treatment	Cognitive
4	Sludge recovery technologies	Cognitive

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

No.	Core Competences	Essential Virtues	Teaching Methods	Assessment
1	AD	123	Lecture, Discussion	Testing, Discussion(including classroom and online), Report(including oral and written)

2	CD	345	Lecture, Discussion	Testing, Discussion(including classroom and online), Report(including oral and written)
3	CDE	567	Lecture, Discussion	Testing, Discussion(including classroom and online), Report(including oral and written)
4	BF	678	Lecture, Discussion	Testing, Discussion(including classroom and online), Report(including oral and written)

### Course Schedule

Week	Date	Course Contents	Note
1	112/02/13 ~ 112/02/19	Introduction	2/15
2	112/02/20 ~ 112/02/26	Sources & Characteristics	2/22
3	112/02/27 ~ 112/03/05	Sources & Characteristics	3/1
4	112/03/06 ~ 112/03/12	Thickening	3/8
5	112/03/13 ~ 112/03/19	Stabilization	3/15
6	112/03/20 ~ 112/03/26	Disinfections	3/22
7	112/03/27 ~ 112/04/02	Conditioning	3/29
8	112/04/03 ~ 112/04/09	Spring vocation	
9	112/04/10 ~ 112/04/16	Dewatering	4/12
10	112/04/17 ~ 112/04/23	Mid-term exam	4/19
11	112/04/24 ~ 112/04/30	Drying	4/26
12	112/05/01 ~ 112/05/07	Incineration	5/3
13	112/05/08 ~ 112/05/14	Sintering and Melting	5/10
14	112/05/15 ~ 112/05/21	Site visiting	5/17
15	112/05/22 ~ 112/05/28	Solidification	5/24
16	112/05/29 ~ 112/06/04	Composting	5/31
17	112/06/05 ~ 112/06/11	Final exam	6/7

18	112/06/12~ 112/06/18	Discussion	6/14
Requirement			
Teaching Facility	Computer		
Textbooks and Teaching Materials	Metcalf and Eddy, "Wastewater Engineering: Treatment and Reuse" , McGraw-Hill, Inc., 4th. Ed. 2004.		
Number of Assignment(s)	(Filled in by assignment instructor only)		
Grading Policy	◆ Attendance :           %   ◆ Mark of Usual : 50.0 %   ◆ Midterm Exam : 25.0 % ◆ Final Exam :   25.0 % ◆ Other (    ) :           %		
Note	This syllabus may be uploaded at the website of Course Syllabus Management System at <a href="http://info.ais.tku.edu.tw/csp">http://info.ais.tku.edu.tw/csp</a> or through the link of Course Syllabus Upload posted on the home page of TKU Office of Academic Affairs at <a href="http://www.acad.tku.edu.tw/CS/main.php">http://www.acad.tku.edu.tw/CS/main.php</a> . <b>※ Unauthorized photocopying is illegal. Using original textbooks is advised. It is a crime to improperly photocopy others' publications.</b>		