

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

Course Title	PHYSICAL AND CHEMICAL TREATMENT PROCESSES	Instructor	CHING-YU PENG
Course Class	TEWXM1A MASTER'S 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>
<p>Departmental Aim of Education</p> <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>			
<p>Subject Departmental core competences</p> <p>C. Logical thinking, analysis, integration, problem-solving skills, engineering planning, design and implementation ability.(ratio:70.00)</p> <p>E. Capabilities of writing and presenting research report.(ratio:30.00)</p>			
<p>Subject Schoolwide essential virtues</p> <p>2. Information literacy. (ratio:30.00)</p> <p>4. Moral integrity. (ratio:70.00)</p>			
Course Introduction	<p>Through journal papers reading, understand and learn how to apply up-to-date environmental physical and chemical treatment processes for contaminants removal.</p>		

**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. Understand the theory and mechanisms governing physical and chemical treatment processes	Cognitive
2	Understand and apply the theory underlying each process	Cognitive

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

No.	Core Competences	Essential Virtues	Teaching Methods	Assessment
1	CE	2	Lecture	Testing
2	CE	24	Discussion	Report(including oral and written)

**Course Schedule**

Week	Date	Course Contents	Note
1	109/09/14 ~ 109/09/20	Introduction to physical-chemical treatment processes	
2	109/09/21 ~ 109/09/27	Ion Exchange (I)	
3	109/09/28 ~ 109/10/04	Ion Exchange (II)	
4	109/10/05 ~ 109/10/11	Ion Exchange (III)	
5	109/10/12 ~ 109/10/18	Granular Filtration (I)	
6	109/10/19 ~ 109/10/25	Granular Filtration (II)	
7	109/10/26 ~ 109/11/01	Granular Filtration (III)	
8	109/11/02 ~ 109/11/08	Secondary treatment (I)	
9	109/11/09 ~ 109/11/15	Secondary treatment (II)	
10	109/11/16 ~ 109/11/22	Midterm Exam	

11	109/11/23 ~ 109/11/29	Secondary Treatment (III)	
12	109/11/30 ~ 109/12/06	Carbon Adsorption (I)	
13	109/12/07 ~ 109/12/13	Carbon Adsorption (II)	
14	109/12/14 ~ 109/12/20	Carbon Adsorption (III)	
15	109/12/21 ~ 109/12/27	Removal of selected constituents (I)	
16	109/12/28 ~ 110/01/03	Removal of selected constituents (II)	
17	110/01/04 ~ 110/01/10	Removal of selected constituents (III)	
18	110/01/11 ~ 110/01/17	Final Exam	
Requirement	1. There will be paper presentation, and journal review. Missed paper presentation or journal review counts as a zero.		
Teaching Facility	Computer, Projector		
Textbooks and Teaching Materials	Water and Wastewater Engineering: Design Principles & Practice, Davis, 2011		
References	Selected papers Water Treatment Principles and Design, 2nd ed. by Montgomery Watson Harza		
Number of Assignment(s)	2 (Filled in by assignment instructor only)		
Grading Policy	◆ Attendance : 10.0 %   ◆ Mark of Usual :   %   ◆ Midterm Exam : 20.0 % ◆ Final Exam : 20.0 % ◆ Other (Oral Presentation) : 50.0 %		
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>		