

## Tamkang University Academic Year 110, 2nd Semester Course Syllabus

Course Title	SPECIAL TOPICS ON AQUATIC CHEMISTRY	Instructor	LI, CHI-WANG
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	SDG6 Clean water and sanitation		
<b>Departmental Aim of Education</b>			
<ul style="list-style-type: none"> <li>I. Cultivating students with capabilities of carrying out practical works or academic research related to water resources and environmental engineering.</li> <li>II. Cultivating students with capability of solving problems through researching, planning, and management.</li> <li>III. Cultivating students to become professional engineers with care in environment and professional ethics.</li> <li>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.</li> </ul>			
<b>Subject Departmental core competences</b>			
<ul style="list-style-type: none"> <li>A. Mathematical and engineering knowledge needed for water resources and environmental engineering applications.(ratio:30.00)</li> <li>D. Skill of using professional foreign language and global perspective.(ratio:20.00)</li> <li>E. Capabilities of writing and presenting research report.(ratio:50.00)</li> </ul>			
<b>Subject Schoolwide essential virtues</b>			
5. Independent thinking. (ratio:100.00)			
Course Introduction	<p>In this course, chemical equilibrium modeling software will be used to model water and wastewater treatment processes. Selected papers related to acid/base, precipitation, complexation, and gas/liquid equilibrium will be discussed.</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	Understand the principles of chemical equilibrium and application	Cognitive

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

No.	Core Competences	Essential Virtues	Teaching Methods	Assessment
1	ADE	5	Discussion, Publication	Study Assignments, Discussion(including classroom and online), Report(including oral and written)

**Course Schedule**

Week	Date	Course Contents	Note
1	111/02/21 ~ 111/02/25	Introduction	
2	111/02/28 ~ 111/03/04	Software for solving Chemical equilibrium	
3	111/03/07 ~ 111/03/11	Software for solving Chemical equilibrium	
4	111/03/14 ~ 111/03/18	Software for solving Chemical equilibrium	
5	111/03/21 ~ 111/03/25	Papers: acid/base chemistry	
6	111/03/28 ~ 111/04/01	Papers: acid/base chemistry	
7	111/04/04 ~ 111/04/08	Papers: acid/base chemistry	
8	111/04/11 ~ 111/04/15	Papers: complexation	
9	111/04/18 ~ 111/04/22	Midterm Exam Week	
10	111/04/25 ~ 111/04/29	Papers: complexation	
11	111/05/02 ~ 111/05/06	Papers: complexation	

12	111/05/09 ~ 111/05/13	Paper: Gas/liquid equilibrium	
13	111/05/16 ~ 111/05/20	Paper: Gas/liquid equilibrium	
14	111/05/23 ~ 111/05/27	Paper: Gas/liquid equilibrium	
15	111/05/30 ~ 111/06/03	Paper: precipitation	
16	111/06/06 ~ 111/06/10	Paper: precipitation	
17	111/06/13 ~ 111/06/17	Final Exam Week	
18	111/06/20 ~ 111/06/24	Paper: precipitation	
Requirement			
Teaching Facility	Computer		
Textbooks and Teaching Materials			
References			
Number of Assignment(s)	10 (Filled in by assignment instructor only)		
Grading Policy	◆ Attendance :           %   ◆ Mark of Usual :           %   ◆ Midterm Exam : 20.0 % ◆ Final Exam :   20.0 % ◆ Other <HW, two tests (40%)> : 60.0 %		
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>		