Tamkang University Academic Year 112, 2nd Semester Course Syllabus

Course Title	AQUATIC CHEMISTRY	Instructor	LI, CHI-WANG
Course Class	TEWXM1A MASTER'S PROGRAM, DEPARTMENT OF WATER RESOURCES AND ENVIRONMENTAL ENGINEERING, 1A	Details	◆ General Course ◆ Selective ◆ One Semester
Relevance to SDGs	SDG6 Clean water and sanitation		

Departmental Aim of Education

Ⅰ. Cultivating students with capabilities of carrying out practical works or academic research related to water resources and environmental engineering.

Ⅱ. Cultivating students with capability of solving problems through researching, planning, and management.

Ⅲ. Cultivating students to become professional engineers with care in environment and professional ethics.

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.

Subject Departmental core competences

A. Mathematical and engineering knowledge needed for water resources and environmental engineering applications.(ratio:20.00)

B. Capabilities of planning and conducting experiments, analyzing and explaining experimental data, applying information tool, and collecting and compiling data. (ratio:20.00)

C. Logical thinking, analysis, integration, problem-solving skills, engineering planning, design and implementation ability.(ratio:25.00)

D. Skill of using professional foreign language and global perspective.(ratio:20.00)

E. Capabilities of writing and presenting research report.(ratio:10.00)

F. Awareness of the importance of teamwork, working attitude and professional ethics, and to learn continuously.(ratio:5.00)

Subject Schoolwide essential virtues

1. A global perspective. (ratio:25.00)

2. Information literacy. (ratio:20.00)

3. A vision for the future. (ratio:5.00)

4. Moral integrity. (ratio:5.00)

5. Independent thinking. (ratio:30.00)

6. A cheerful attitude and healthy lifestyle. (ratio:5.00)

7. A spirit of teamwork and dedication. (ratio:5.00)

8. A sense of aesthetic appreciation. (ratio:5.00)

Course Introduction	Principles of chemical equilibrium related to the treatment of water and wastewater are introduced. The effects of chemical interaction of domestic and industrial waste effluents on natural water system are discussed.

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	ABCDEF	12345678	Lecture, Discussion	Testing, Study Assignments

Course Schedule

Week	Date	Course Contents	Note
1	113/02/19 ~ 113/02/25	Introduction, Basic concept	
2	113/02/26 ~ 113/03/03	Fundamentals of thermodynamics	

3	113/03/04 ~ 113/03/10	Acid and base (I)	
4	113/03/11 ~ 113/03/17	Acid and base (II)	
5	113/03/18 ~ 113/03/24	Acid and base (III)	
6	113/03/25 ~ 113/03/31	Titration and buffer	
7	113/04/01 ~ 113/04/07	Titration and buffer	
8	113/04/08 ~ 113/04/14	Software for solving Chemical equilibrium	
9	113/04/15 ~ 113/04/21	Midterm Exam Week	
10	113/04/22 ~ 113/04/28	Software for solving Chemical equilibrium	
11	113/04/29 ~ 113/05/05	Gas/liquid equilibrium	
12	113/05/06 ~ 113/05/12	Gas/liquid equilibrium	
13	113/05/13 ~ 113/05/19	Gas/liquid equilibrium	
14	113/05/20 ~ 113/05/26	Metals	
15	113/05/27 ~ 113/06/02	Metals	
16	113/06/03 ~ 113/06/09	Metals	
17	113/06/10 ~ 113/06/16	Final Exam Week	
18	113/06/17 ~ 113/06/23	Supplementary teaching: Oxidation/reduction	

Key capabilities	
Interdisciplinary	
Distinctive teaching	
Course Content	Intellectual Property (learning intellectual property)

Requirement	
Textbooks and Teaching Materials	Self-made teaching materials:Presentations
References	
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 http://info.ais.tku.edu.tw/csp or through the link of Course Syllabus Upload posted on the home page of TKU Office of Academic Affairs at http://www.acad.tku.edu.tw/CS/main.php . **※ Unauthorized photocopying is illegal. Using original textbooks is advised. It is a crime to improperly photocopy others' publications.**