

Tamkang University Academic Year 111, 2nd Semester Course Syllabus

Course Title	SPECIAL TOPIC ON ADVANCED OXIDATION PROCESSES	Instructor	YA VINH
Course Class	TEWXD1A DOCTORAL PROGRAM, DEPARTMENT OF WATER RESOURCES AND ENVIRONMENTAL ENGINEERING, 1A	Details	<ul style="list-style-type: none"> ◆ General Course ◆ Selective ◆ One Semester
Relevance to SDGs	SDG6 Clean water and sanitation		
Departmental Aim of Education			
<ul style="list-style-type: none"> 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			
<ul style="list-style-type: none"> 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			
<ul style="list-style-type: none"> 1. A global perspective. (ratio:25.00) 2. Information literacy. (ratio:30.00) 3. A vision for the future. (ratio:5.00) 			

4. Moral integrity. (ratio:5.00)
5. Independent thinking. (ratio:20.00)
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

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.

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	Discussion, Publication	Study Assignments, 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	112/02/20 ~ 112/02/26	Software for solving Chemical equilibrium	
3	112/02/27 ~ 112/03/05	Software for solving Chemical equilibrium	
4	112/03/06 ~ 112/03/12	Software for solving Chemical equilibrium	
5	112/03/13 ~ 112/03/19	Papers: acid/base chemistry	
6	112/03/20 ~ 112/03/26	Papers: acid/base chemistry	
7	112/03/27 ~ 112/04/02	Papers: acid/base chemistry	
8	112/04/03 ~ 112/04/09	Papers: complexation	
9	112/04/10 ~ 112/04/16	Papers: complexation	
10	112/04/17 ~ 112/04/23	Midterm Exam Week	
11	112/04/24 ~ 112/04/30	Papers: complexation	
12	112/05/01 ~ 112/05/07	Paper: Gas/liquid equilibrium	
13	112/05/08 ~ 112/05/14	Paper: Gas/liquid equilibrium	
14	112/05/15 ~ 112/05/21	Paper: Gas/liquid equilibrium	
15	112/05/22 ~ 112/05/28	Paper: precipitation	
16	112/05/29 ~ 112/06/04	Paper: precipitation	
17	112/06/05 ~ 112/06/11	Paper: precipitation	
18	112/06/12 ~ 112/06/18	Final Exam Week	
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) : 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.