# Tamkang University Academic Year 114, 2nd Semester Course Syllabus

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| Course Title | GENERAL CHEMISTRY | Instructor | HSIEH, HSIAO-CHI |
| Course Class | TEDXB1A<br>DEPARTMENT OF CHEMICAL AND MATERIALS ENGINEERING, 1A | Details | ◆ General Course<br>◆ Required<br>◆ 2nd Semester<br>◆ 2 Credits |
| Relevance to SDGs | SDG4 Quality education | | |

## Departmental Aim of Education

Education Objectives: Cultivation of chemical/materials engineering experts possessing professional knowledge, skills, and literacy.

## Subject Departmental core competences

A. Qualified basic and core knowledge of chemical/materials engineering.(ratio:60.00)

B. Qualified capabilities to conduct chemical/materials engineering experiments and analyze experiment results.(ratio:5.00)

C. Qualified capabilities to use the techniques and tools for solving chemical/materials engineering problems.(ratio:5.00)

D. Qualified capability to analyze and design the components, processes, and systems of chemical/materials engineering.(ratio:5.00)

E. Qualified capability to manage and integrate cross-field projects and to communicate and cooperate with team members.(ratio:5.00)

F. Qualified capability to explore, analyze, and handle engineering problems while considering sustainable development.(ratio:5.00)

G. Comprehend contemporary issues and understand the interplay between chemical/materials engineering technologies, environmental sustainability, and societal cultural well-being, and develop the capability and habits of lifelong learning.(ratio:10.00)

H. Understand professional information ethics and social responsibility for chemical/materials engineers.(ratio:5.00)

## Subject Schoolwide essential virtues

1. A global perspective. (ratio:10.00)

2. Information literacy. (ratio:15.00)

3. A vision for the future. (ratio:15.00)

4. Moral integrity. (ratio:15.00)

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)

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| Course Introduction | This course aims to provide an introduction to the basic principles and practical applications of data processing and analysis, as well as topics such as chemical equilibrium and titration within the field of analytical chemistry.<br>Students can learn the principles and applications of analytical chemistry through this course, serving as foundational knowledge for future studies in related disciplines. |

**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 | Data processing and analysis<br>Analysis of chemical equilibrium<br>Titration methods | Cognitive |

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

| No. | Core Competences | Essential Virtues | Teaching Methods | Assessment |
|---|---|---|---|---|
| 1 | ABCDEFGH | 12345678 | Lecture, Discussion | Testing, Study Assignments |

Course Schedule

| Week | Date | Course Contents | Note |
|---|---|---|---|
| 1 | 115/02/23 ~ 115/03/01 | Introduction of Analytical Chemistry | |

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| 2 | 115/03/02 ~ 115/03/08 | Sampling and Sample Preparation | |
| 3 | 115/03/09 ~ 115/03/15 | Gravimetric and Conbustion Analysis | |
| 4 | 115/03/16 ~ 115/03/22 | Introduction of Titrimetric Analysis | |
| 5 | 115/03/23 ~ 115/03/29 | Applications of Titrimetric Analysis-(Acis-Base Titrations) | |
| 6 | 115/03/30 ~ 115/04/05 | Applications of Titrimetric Analysis-(Buffers) | |
| 7 | 115/04/06 ~ 115/04/12 | Applications of Titrimetric Analysis-(Polyprotic Acis-Base) | |
| 8 | 115/04/13 ~ 115/04/19 | Applications of Titrimetric Analysis-(Polyprotic Acis-Base) | |
| 9 | 115/04/20 ~ 115/04/26 | 期中考/期中評量週(老師得自行調整週次) | |
| 10 | 115/04/27 ~ 115/05/03 | Applications of Titrimetric Analysis-(Chemical Equilibrium) | |
| 11 | 115/05/04 ~ 115/05/10 | Applications of Titrimetric Analysis-(EDTA Titrations) | |
| 12 | 115/05/11 ~ 115/05/17 | Electroanalytical methods-(Redox Potentials) | |
| 13 | 115/05/18 ~ 115/05/24 | Electroanalytical methods-(Electrode Potentials) | |
| 14 | 115/05/25 ~ 115/05/31 | Electroanalytical methods-(Electrode Measurements) | |
| 15 | 115/06/01 ~ 115/06/07 | Introduction to Spectrochemical methods | |
| 16 | 115/06/08 ~ 115/06/14 | Final Week of Diverse Assessments | |
| 17 | 115/06/15 ~ 115/06/21 | Final Week of Diverse Assessments/Flexible Teaching Week for Teachers | |
| 18 | 115/06/22 ~ 115/06/28 | Flexible Teaching Week for Teachers | |

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| Key capabilities | self-directed learning<br>Problem solving |
| Interdisciplinary | |
| Distinctive teaching | |

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| Course Content | Logical Thinking<br>Green Energy |
| Requirement | |
| Textbooks and Teaching Materials | Self-made teaching materials:Presentations<br>Using teaching materials from other writers:Textbooks<br>Name of teaching materials:<br>John Kenkel,Analytical Chemistry for Technicians 4th<br>Daniel C. Harris, Exploring Chemical Analysis 5th<br>Skoog, Fundamentals of Analytical Chemistry 10/e |
| References | |
| Grading Policy | ◆ Attendance： 10.0 % ◆ Mark of Usual： % ◆ Midterm Exam： 35.0 %<br>◆ Final Exam： 35.0 %<br>◆ Other〈作業、課堂問答〉：20.0 % |
| Note | This syllabus may be uploaded at the website of Course Syllabus Management System at https://web2.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.<br>※"Adhere to the concept of intellectual property rights" and "Do not illegally photocopy, download, or distribute." Using original textbooks is advised. It is a crime to improperly photocopy others' publications. |