

## Tamkang University Academic Year 114, 1st Semester Course Syllabus

Course Title	INSTRUMENTAL ANALYSIS	Instructor	CHIA-CHI HUANG
Course Class	TSCXB3A DEPARTMENT OF CHEMISTRY, 3A	Details	◆ General Course ◆ Required ◆ 1st Semester ◆ 3 Credits
Relevance to SDGs	SDG4 Quality education SDG5 Gender equality		
D e p a r t m e n t a l   A i m   o f   E d u c a t i o n			
I . Cultivate the basic professional knowledge and experimental techniques. II . Cultivate the capacity of practical implementation. III . Cultivate professional ethics and lifelong learning.			
Subject Departmental core competences			
A. Possess basic scientific knowledge such as mathematics and physics, and apply them to related fields in chemistry.(ratio:10.00) B. Possess basic knowledge in chemistry such as organic, physical, inorganic, and instrumental analysis, and extend them into biochemistry, material chemistry, and related chemistry. (ratio:50.00) C. Possess basic experimental chemistry techniques and apply them to other chemistry-related experimental works.(ratio:10.00) D. Possess collecting and analyzing chemistry-related information and apply them to basic research ability and seminar participation.(ratio:20.00) E. Possess the professional ethics in chemistry workplace and apply them to solve chemistry problem.(ratio:10.00)			
Subject Schoolwide essential virtues			
1. A global perspective. (ratio:5.00) 2. Information literacy. (ratio:20.00) 3. A vision for the future. (ratio:20.00) 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:10.00)				
8. A sense of aesthetic appreciation. (ratio:5.00)				
Course Introduction	This class focuses on modern Instrumental analysis for chemical applications. During autumn 2024, we will learn the principles and practices in the following courses.  1. Atomic Absorption Spectroscopy 2. Atomic Emission Spectroscopy 3. Visible and Ultraviolet Molecular spectroscopy 4. Fluorescence spectroscopy 5. Infrared Spectroscopy 6. Raman Spectroscopy 7. Mass spectroscopy 8. NMR spectroscopy			
<p><b>The correspondences between the course's instructional objectives and the cognitive, affective, and psychomotor objectives.</b></p> <p>Differentiate the various objective methods among the cognitive, affective and psychomotor domains of the course's instructional objectives.</p> <p>I. Cognitive : Emphasis upon the study of various kinds of knowledge in the cognition of the course's veracity, conception, procedures, outcomes, etc.</p> <p>II.Affective : Emphasis upon the study of various kinds of knowledge in the course's appeal, morals, attitude, conviction, values, etc.</p> <p>III.Psychomotor: Emphasis upon the study of the course's physical activity and technical manipulation.</p>				
No.	Teaching Objectives			objective methods
1	This class focuses on modern Instrumental analysis for chemical applications.			Cognitive
The correspondences of teaching objectives : core competences, essential virtues, teaching methods, and assessment				
No.	Core Competences	Essential Virtues	Teaching Methods	Assessment
1	ABCDE	12345678	Lecture	Testing
Course Schedule				
Week	Date	Course Contents		Note
1	114/09/15 ~ 114/09/21	Introduction & Working Curve		
2	114/09/22 ~ 114/09/28	Signals and Noise		
3	114/09/29 ~ 114/10/05	Holiday; Components of Optical Instruments		
4	114/10/06 ~ 114/10/12	Holiday; Components of Optical Instruments		EXAM (I): OPEN BOOK

5	114/10/13 ~ 114/10/19	Atomic Absorption Spectrometry	
6	114/10/20 ~ 114/10/26	Atomic Emission Spectrometry	
7	114/10/27 ~ 114/11/02	Ultraviolet-Visible Molecular Absorption Spectrometry	
8	114/11/03 ~ 114/11/09	Ultraviolet-Visible Molecular Absorption Spectrometry	
9	114/11/10 ~ 114/11/16	Midterm Exam	EXAM (II)
10	114/11/17 ~ 114/11/23	Fluorescence Spectrometry	
11	114/11/24 ~ 114/11/30	Fluorescence Spectrometry	
12	114/12/01 ~ 114/12/07	Molecular Mass Spectrometry	
13	114/12/08 ~ 114/12/14	Molecular Mass Spectrometry	
14	114/12/15 ~ 114/12/21	Nuclear Magnetic Resonance Spectroscopy	
15	114/12/22 ~ 114/12/28	Nuclear Magnetic Resonance Spectroscopy	
16	114/12/29 ~ 115/01/04	Final Exam	EXAM (III)
17	115/01/05 ~ 115/01/11	Flexible Teaching Week for Teachers	
18	115/01/12 ~ 115/01/18	Flexible Teaching Week for Teachers	
Key capabilities	Information Technology Problem solving Interdisciplinary		
Interdisciplinary	STEAM course (S:Science, T:Technology, E:Engineering, M:Math, A field:Integration of Art and Humanist)		
Distinctive teaching	Major subject		
Course Content	Green Energy Sustainability issue		
Requirement	1. Please do not ask me to adjust your final score when yours is a failure. 2. Infrared and Raman spectroscopies will be delivered in 2026 spring.		

Textbooks and Teaching Materials	Using teaching materials from other writers:Textbooks, Journals Name of teaching materials: Principles of instrumental analysis 7th edition; Skoog et al..
References	Journals
Grading Policy	<p>◆ Attendance : 20.0 %    ◆ Mark of Usual :       %    ◆ Midterm Exam : 30.0 %</p> <p>◆ Final Exam : 30.0 %</p> <p>◆ Other &lt;EXAM (I)&gt; : 20.0 %</p>
Note	<p>This syllabus may be uploaded at the website of Course Syllabus Management System at <a href="https://web2.ais.tku.edu.tw/csp">https://web2.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>.</p> <p>※"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.</p>