

## Tamkang University Academic Year 111, 1st Semester Course Syllabus

Course Title	INSTRUMENTAL ANALYSIS	Instructor	CHIA-CHI HUANG
Course Class	TSCCB3A DEPARTMENT OF CHEMISTRY-CHEMISTRY AND BIOCHEMISTRY DIVISION, 3A	Details	<ul style="list-style-type: none"> <li>◆ General Course</li> <li>◆ Required</li> <li>◆ 1st Semester</li> </ul>
Relevance to SDGs	SDG4 Quality education SDG5 Gender equality		
<b>Departmental Aim of Education</b>			
I. Cultivate the basic professional knowledge and experimental techniques. II. Cultivate the capacity of practical implementation. III. Cultivate professional ethics and lifelong learning.			
<b>Subject Departmental core competences</b>			
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)			
<b>Subject Schoolwide essential virtues</b>			
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:10.00) 5. Independent thinking. (ratio:15.00) 6. A cheerful attitude and healthy lifestyle. (ratio:15.00)			

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

8. A sense of aesthetic appreciation. (ratio:10.00)

**Course  
Introduction**

This course focuses on modern Instrumental analysis for chemical applications.  
During autumn 2022, we will learn the principles and practices in  
Visible and Ultraviolet Molecular spectroscopy  
Luminescence spectroscopy  
Infrared Spectroscopy  
Raman Spectroscopy  
Nuclear Magnetic Resonance spectroscopy  
Atomic Absorption Spectroscopy, and  
Atomic Emission Spectroscopy.

**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	After completing this coursework, students are expected to understand the theories supporting each instrumental analysis method and hardware. This course also prepares them for the future applications of modern instrumental analyses to their work or research.	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	111/09/05 ~ 111/09/11	Introduction	
2	111/09/12 ~ 111/09/18	Signals and Noise	

3	111/09/19 ~ 111/09/25	Components of Optical Instruments	
4	111/09/26 ~ 111/10/02	Atomic Absorption and Atomic Fluorescence Spectrometry	
5	111/10/03 ~ 111/10/09	Atomic Emission Spectrometry	
6	111/10/10 ~ 111/10/16	Atomic Emission Spectrometry	10/10 National Holiday
7	111/10/17 ~ 111/10/23	Atomic Mass Spectrometry	
8	111/10/24 ~ 111/10/30	Atomic X-Ray Spectrometry	
9	111/10/31 ~ 111/11/06	Review Atomic Spectroscopy	Homework-1
10	111/11/07 ~ 111/11/13	Midterm Exam Week	
11	111/11/14 ~ 111/11/20	Ultraviolet-Visible Molecular Absorption Spectrometry	
12	111/11/21 ~ 111/11/27	Molecular Luminescence Spectrometry	
13	111/11/28 ~ 111/12/04	Infrared Spectrometry	
14	111/12/05 ~ 111/12/11	Raman Spectroscopy	
15	111/12/12 ~ 111/12/18	Nuclear Magnetic Resonance Spectroscopy	
16	111/12/19 ~ 111/12/25	Molecular Mass Spectrometry	
17	111/12/26 ~ 112/01/01	Review Molecular Spectroscopy	Homework-2
18	112/01/02 ~ 112/01/08	Final Exam Week	
Requirement			
Teaching Facility	Computer, Projector		
Textbooks and Teaching Materials	Principles of Instrumental Analysis, 7E ; Author(s): Douglas A. Skoog   F. James Holler   Stanley R. Crouch ; ISBN: 9789353506193		
References	Journals		
Number of Assignment(s)	(Filled in by assignment instructor only)		
Grading Policy	◆ Attendance : 10.0 %   ◆ Mark of Usual :   %   ◆ Midterm Exam : 30.0 % ◆ Final Exam : 30.0 % ◆ Other 〈Homework〉 : 30.0 %		

Note	<p>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> .</p> <p>※ <b>Unauthorized photocopying is illegal. Using original textbooks is advised. It is a crime to improperly photocopy others' publications.</b></p>
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