

Tamkang University Academic Year 109, 2nd Semester Course Syllabus

Course Title	ADVANCED SPECTROSCOPY IN CHEMISTRY	Instructor	CHIA-CHI HUANG
Course Class	TSCXM1A MASTER'S PROGRAM, DEPARTMENT OF CHEMISTRY, 1A	Details	<ul style="list-style-type: none"> ◆ General Course ◆ Selective ◆ One Semester
Relevance to SDGs	SDG4 Quality education SDG8 Decent work and economic growth SDG9 Industry, Innovation, and Infrastructure SDG16 Peace, justice and strong institutions		
Departmental Aim of Education			
I. Cultivate the advanced 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 advanced 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 research ability and seminar participation in chemistry-related projects, and independently finish writing the research paper.(ratio:30.00) E. Possess collecting and analyzing information in chemistry and apply them to solve chemistry problems.(ratio:20.00)			
Subject Schoolwide essential virtues			
3. A vision for the future. (ratio:20.00) 5. Independent thinking. (ratio:60.00) 7. A spirit of teamwork and dedication. (ratio:20.00)			

Course Introduction	<p>This course provides advanced knowledge in analytical spectroscopy. The students will receive an introduction to spectroscopy and instrumentation based on necessary theories of optics. It then focuses on the specifics of UV-Vis, fluorescence, infrared, Raman, and SERS spectroscopies. The second part of the course involves the know-how of chemical analyses. It addresses sample collection and preparation, measurement techniques, and the R&D and applications of each technology. The course will conclude with oral presentations of relevant information by the students.</p>
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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	(I) Understanding the trends in the advance of analytical spectroscopy (II) Consolidating the concept and the practice of spectroscopy (III) Addressing new and original knowledge in spectroscopic applications	Cognitive

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

No.	Core Competences	Essential Virtues	Teaching Methods	Assessment
1	ACE	357	Lecture	Testing, Report(including oral and written), Attendance

Course Schedule

Week	Date	Course Contents	Note
1	110/02/22 ~ 110/02/28	Basic Optics and Spectroscopy	
2	110/03/01 ~ 110/03/07	Instrumentation	
3	110/03/08 ~ 110/03/14	UV-Vis Spectroscopy	

4	110/03/15 ~ 110/03/21	Fluorescence Spectroscopy	
5	110/03/22 ~ 110/03/28	Infrared Spectroscopy	
6	110/03/29 ~ 110/04/04	No class	Holiday
7	110/04/05 ~ 110/04/11	Raman Spectroscopy	
8	110/04/12 ~ 110/04/18	Surface-Enhanced Raman Spectroscopy	
9	110/04/19 ~ 110/04/25	Sample Collection	
10	110/04/26 ~ 110/05/02	Mid-term Exam	
11	110/05/03 ~ 110/05/09	Sample Preparation	
12	110/05/10 ~ 110/05/16	Term Review	
13	110/05/17 ~ 110/05/23	Applications of UV-Vis and Fluorescence Spectroscopy	
14	110/05/24 ~ 110/05/30	Applications of Infrared and Raman Spectroscopy	
15	110/05/31 ~ 110/06/06	Oral Presentations	
16	110/06/07 ~ 110/06/13	Oral Presentations	
17	110/06/14 ~ 110/06/20	Oral Presentations	
18	110/06/21 ~ 110/06/27	Final Exam	
Requirement			
Teaching Facility	Computer, Projector		
Textbooks and Teaching Materials	1. Handbook of Spectroscopy: Second, Enlarged Edition; Editor(s): Prof. Dr. Günter Gauglitz Dr. David S. Moore (https://onlinelibrary.wiley.com/doi/book/10.1002/9783527654703)		
References	Essentials of Pharmaceutical Analysis (https://link.springer.com/book/10.1007/978-981-15-1547-7) Organic Spectroscopy (https://link.springer.com/chapter/10.1007/978-1-4020-2575-4_2) Principles of Fluorescence Spectroscopy (https://link.springer.com/book/10.1007/978-0-387-46312-4)		
Number of Assignment(s)	(Filled in by assignment instructor only)		
Grading Policy	◆ Attendance : 20.0 % ◆ Mark of Usual : % ◆ Midterm Exam : 30.0 % ◆ Final Exam : 50.0 % ◆ Other () : %		

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