

Course Syllabus

 Edit

The syllabuses on both this page and the NTU online course information are synchronized.

Course Information

Item	Content
Course title	Advanced Topics in Physical Chemistry
Semester	114-2
Designated for	GRADUATE INSTITUTE OF CHEMICAL ENGINEERING DEPARTMENT OF CHEMICAL ENGINEERING
Instructor	DAVID TAI-WEI WU
Curriculum No.	ChemE 7041
Curriculum Id No.	524 M6180
Class	
Credit	3
Full/Half Yr.	Half
Required/Elective	Elective
Time	Wednesday 7,8,9(14:20~17:20)
Place	聯電講堂
Remarks	The course is conducted in English °

Course Syllabus

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Course Description	This course will provide an introduction to key advanced topics in physical chemistry, including in quantum mechanics, statistical mechanics, kinetics and soft matter.
Course Objective	This course aims to introduce advanced topics in physical chemistry that are of active and central interest at the frontiers of research in physical sciences and engineering, as well as their applications in materials and biology.
Course Requirement	Undergraduate Physical Chemistry
Expected weekly study hours before and/or after class	
References	No assigned textbook.
Designated Reading	

Progress

Week	Date	Topic
Week 1		Introduction
Week 2		Intro to QM
Week 3		Quantum Probability, Entanglement and Bell's Inequality
Week 4		Quantum Chemistry
Week 5		Spin-Statistics, Fermi Liquids, and Bose-Einstein Condensates
Week 6		Density Functional Theory
Week 7		Quantum Information & Quantum Computing
Week 8		Onsager Reciprocal Relations, Fluctuation Dissipation Theorem
Week 9		Non-equilibrium fluctuation relations (Jarzynski, Crooks, single-molecule experiments)
Week 10		Active Matter
Week 11		Midterm Journal Article Presentations
Week 12		Critical Phenomena and RG / Coarse-Graining & Effective Hamiltonians
Week 13		Rate Theory (Transition State Theory and Reactive Flux Theory) - online video
Week 14		Soft Matter, Polymer Statistics, Elasticity and Thermodynamics
Week 15		Classical Nucleation Theory (optional)
Week 16		Term Paper due / Term Presentations

Makeup Class Information

NO	Date	Start Time	End Time	Location or Method

Grading

NO	Item	Pc	Explanations for the conditions

Adjustment methods for students

	Adjustment method
Teaching methods	
Assignment submission methods	
Exam methods	
Others	

Office Hour

Remarks	None
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