

Advanced Chemistry of Materials

Credits: 3

Classroom: B105, Institute of Chemistry, Academia Sinica

Class hour: Every Tuesday, 9:00 a.m. –12:00 p.m.

Week	Date	Topics	Lecturers
1	2/21	Fundamentals of Nanomedicine	Hsien-Ming Lee
2	2/28	Peace Memorial day	No class
3	3/7	Introduction of On-Market Nanomedicine Product	Hsien-Ming Lee
4	3/14	Surface Characterization for Solid Catalyst	Cedric Po-Wen Chung
5	3/21	Surface Characterization for Solid Catalyst	Cedric Po-Wen Chung
6	3/28	Stimuli-responsive Materials	Shih-Sheng Sun
7	4/4	Bridge Holiday	No class
8	4/11	Stimuli-responsive Materials	Shih-Sheng Sun
9	4/18	Midterm Exam	
10	4/25	Organic Thin Films by Self-assembly	Yu-Tai Tao
11	5/2	Organic Thin Films by Self-assembly	Yu-Tai Tao
12	5/9	Polymer Chemistry	Hung-Ju Yen
13	5/16	Polymer Chemistry	Hung-Ju Yen
14	5/23	Materials of Organic Solar Cells	Chin-Ti Chen
15	5/30	Materials of Organic Solar Cells	Chin-Ti Chen
16	6/6	Final Exam	

Course Syllabus

- (1) Atomically Precise Metallic Nanostructures (**Hsien-Ming Lee**)
 - Morphosynthesis & Analysis
 - Catalytic Energy Conversion
- (2) Surface Characterization for Solid Catalyst (**Cedric Po-Wen Chung**)
 - Physical/Chemical Surface Characterization for Solid Catalyst
 - In-situ* FT_IR Application for Solid Catalyst
- (3) Stimuli-responsive materials (**Shih-Sheng Sun**)
 - Intermolecular interactions and Molecular Recognition
 - Stimuli-responsive soft materials
 - Stimuli-responsive luminescent materials
- (4) Polymer Chemistry (**Hung-Ju Yen**)
 - Basic concept of polymers and review their synthetic approaches.
 - Material sources and polymerizations for conventional and engineering polymers.
 - Synthesis and applications of high-performance polymers.
- (5) Organic Thin Films by Self-assembly (**Yu-Tai Tao**)
 - Self-Assembled Monolayers (SAMs) :
 - Mixed monolayers
 - Multilayers
 - Monolayer-protected clusters(MPCs)
 - Patterning of surfaces
 - Applications
 - Molecular electronics, OLED, OFET, Memories
- (6) Materials of Organic Solar Cells (**Chin-Ti Chen**)
 - Inorganic semiconducting materials for solar cells
 - Organic photovoltaic (OPV)– Part 1 Organic small molecular materials
 - Organic photovoltaic (OPV) – Part 2 Polymer materials
 - Materials for dye sensitized solar cell (DSSC)
 - Materials for perovskite solar cell (PVSC)