

Advanced Analytical Chemistry

2016/2/24

Credit: 3 credits

Class time: Thursday 9:10-12:00

Lecture room: A507, Institute of Chemistry

Midterm exam : 50%

Final team report: 40%

Attendance: 10%

Handout download

- **Website:** TIGP Nano (from NTU CEIBA)
- http://www.phys.sinica.edu.tw/TIGP-NANO/Course/2016_Spring/2016_Spring_AdvancedAC.html

- **Time:** before 5:00 pm, Wednesday

- **Assistant:**

Liang-Hui, Flora, Wu

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Email: lhwu@phys.sinica.edu.tw

http://www.phys.sinica.edu.tw/TIGP-NANO/Course/2016_Spring/2016_Spring_AdvancedAC.html

[ica.edu.tw/TIGP-NANO/Course/2016_Spring/2016_Spring_AdvancedAC.html](http://www.phys.sinica.edu.tw/TIGP-NANO/Course/2016_Spring/2016_Spring_AdvancedAC.html)



Taiwan International Graduate Program Nano Science and Technology Program



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Advanced Analytical Chemistry

Credits: 3

Lecturer: Yu-Ju Chen 陳玉如老師

Classroom: A507, Institute of Chemistry, Academia Sinica

Class hour: Thursday, 09:10-12:00

Course Syllabus:

Week	Date	Topic	Professor
1	2/25	Introduction	Der-Lii Tzou
2	3/3	General principles in analytical chemistry	Yu-Ju Chen
3	3/10 9:20	Fundamentals of Light Microscopy	Chau-Hwang Lee
4	3/17 9:20	Super-resolution Light Microscopy	Chau-Hwang Lee
5	3/24	Electron Microscopy	WeiHau Chang
6	3/31	Fundamental of Mass Spectrometry (I)	Yi-Sheng Wang
7	4/7	Fundamental of Mass Spectrometry (II)	Yi-Sheng Wang
8	4/14	Application of mass spectrometry to nanotechnology	Yu-Ju chen
9	4/21	Application of mass spectrometry to biology	Yu-Ju chen
10	4/28	Fundamental of Mass Spectrometry	Yi-Sheng Wang

Major Topics

- Basics of Analytical Chemistry
- Physical Methods for Structural Characterization (NMR, MS, EM)
- Optical Microscopy
- Biosensor

Syllabus

Date	Topic	Professor
2/25	Introduction	Der-Lii Tzou
3/3	General principles in Analytical Chemistry	Yu-Ju Chen
3/10	Fundamentals of Light Microscopy	Chau-Hwang Lee
3/17	Super-resolution Light Microscopy	Chau-Hwang Lee
3/24	Electron Microscopy	WeiHau Chang
3/31	Fundamental of Mass Spectrometry (I)	Yi-Sheng Wang
4/7	Fundamental of Mass Spectrometry (II)	Yi-Sheng Wang
4/14	Application of Mass Spectrometry to Nanotechnology	Yu-Ju chen
4/21	Application of Mass Spectrometry to Biology	Yu-Ju chen
4/28	Fundamental of Mass Spectrometry	Yi-Sheng Wang
5/5	NMR spectroscopy-Fundamental and Application	Der-Lii Tzou
5/12	Modern NMR technology-Hand-on Experience	Der-Lii Tzou
5/19	Midterm Exam	Yu-Ju Chen
5/26	XPS	Jing-Jong Shyue
6/2	SIMS	Jing-Jong Shyue
6/9	No class	Dragon Boat Festival
6/16	SPR Sensing	Pei-Kuen Wei
6/23	Biochip - Microarray and Microfluidic Chip	Ji-Yen Cheng

Final Team Report (40%)

The Impact of New Technologies –
For
(A) Material application
OR
(A) Disease detection

Please choose one topic from (A) or (B)

Example:

(2) Emerging New Technologies for Analysis of Circulation Cancer cell

Please choose one of the technologies you learn in the semester related to analysis of circulation cancer cell

- Biochip
- Mass spectrometry
-

(1) Team Information

Each team consists of **3-5** members. It is encouraged to have **members from different departments**. You can have **creative personal profiles** in this section to impress the reviewer.

- Team infrastructure

- Personal CV--Name, department, ID, photo, expertise...etc)

You can find references in the following Journals

- *Nature*
- *Science*

- *Nature Methods*
- *Nature Biotechnology*
- *Nature Chemical Biology*

- *New England Journal of medicine*
- *Cell*
- *Cancer research*

- *Lab-on-chip*
- *Biosensors and Bioelectronics*

Scirus: <http://www.scirus.com>

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Information types	Only show results that are <div><input checked="" type="checkbox"/> Any information type <input type="checkbox"/> Abstracts <input type="checkbox"/> Conferences <input type="checkbox"/> Patents</div>

- Other Search Engines

- **PubMed:** <http://www.ncbi.nlm.nih.gov/sites/entrez>

- PubMed is a service of the U.S. National Library of Medicine that includes over 17 million citations from MEDLINE and other life science journals for biomedical articles back to the 1950s

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for **mass spectrometry and cancer and nature biotechnology** Go Clear [Save Search](#)

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Display Summary Show 20 Sort By Send to

All: 5 Review: 0

Search terms may be topics, authors or journals

Items 1 - 5 of 5

☐ 1: [Rush J, Moritz A, Lee KA, Guo A, Goss VL, Spek EJ, Zhang H, Zha XM, Polakiewicz RD, Comb MJ.](#)

Immunoaffinity profiling of tyrosine phosphorylation in cancer cells.

Nat Biotechnol. 2005 Jan;23(1):94-101. Epub 2004 Dec 12.

PMID: 15592455 [PubMed - indexed for MEDLINE]

☐ 2: [Sun X, Hung K, Wu L, Sidransky D, Guo B.](#)

Detection of tumor mutations in the presence of excess amounts of normal DNA.

Nat Biotechnol. 2002 Feb;20(2):186-9.

PMID: 11821866 [PubMed - indexed for MEDLINE]

(3) Describe the analytical platform and your team work

■ **Meeting and Discussion:** Please report in **details** about how you pick up the papers among the huge number of papers. The details include **WHO and WHAT** individual member comments during the conversation.

Yu-Ju Chen: xxxx

Ji-Yen Cheng: xxxxx

John Smith: xxxxx

(4) Written Report

- Abstract
- Literature
- Analytical strategy
- Presentation of protein atlas

Final Team Report

Objective:

How can nanotechnology impact the analytical strategy for circulation tumor cell?