

Separation Science

Scope:

The course is directed to graduate students who specialize or are interested in **analytical, pharmaceutical, or clinical chemistry**, as well as **biochemistry, biotechnology, systems biology**, and related areas.

It will provide a comprehensive overview of separation science-related technology, methodology, and applications.

Contents (by topic):

1. Introduction
2. Analytical extractions
3. Gas chromatography
4. Liquid chromatography
5. Electrophoresis
6. * Mid-term exam
7. Miniaturization of separations
8. Automation of separations
9. Hydrodynamic separations of particles
10. Ion-mobility spectrometry
11. * Students' presentations
12. Selected applications
13. * Final exam

Evaluation:

* Final mark will be based on the results of the mid-term exam (30%), presentation (30%), and the result of the final exam (40%). Additional points (up to 15%) can be gained for active participation in the class.

Requirements:

Students who have completed the Analytical Chemistry course are encouraged to participate.

Study material:

Handouts will be provided for selected topics.

Textbooks:

1) Lundanes E., Reubsaet L., Greibrokk T. 2014, *Chromatography. Basic Principles, Sample Preparations and Related Methods*. Wiley-VCH, Weinheim.

2) Dettmer-Wilde K., Engewald W. (eds.) 2014, *Practical Gas Chromatography. A Comprehensive Reference*. Springer, Berlin.

3) Fanali S., Haddad P.R., Poole C.F., Riekkola M.-L. (eds.) 2017, *Liquid Chromatography. Volume 1. Fundamentals and Instrumentation. 2nd Edition*. In: Poole C.F. (series ed.) *Handbooks in Separation Science*. Elsevier, Amsterdam.

4) Westermeier R. 2005, *Electrophoresis in Practice: A Guide to Methods and Applications of DNA and Protein Separations. 4th, Revised and Updated Edition*. Wiley-VCH, Weinheim.

5) Eiceman G.A., Karpas Z., Hill Jr. H.H. 2014, *Ion Mobility Spectrometry. Third Edition*. CRC Press, Boca Raton.

Office hour:

Time: Friday, 14:00-15:00.

Place: room 316

Useful links: (This section will be expanded.)

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Handouts (for the participants of this course only):

The handouts and other course materials are currently available in the [NTHU iLMS website](#). You have to log in.