

Outline 324-542 Spectroscopic Analysis (3((3)-0-6)), Semester 1, 2022

Lecture: Arrangement by instructor

Classroom: Online lecture (Zoom, Teams etc.) and on-site

Course coordinator: Assoc.Prof.Dr. Thitima Rujiralai (Office: Ch 313, Email: thitima.r@psu.ac.th)

Course description:

Theory of spectroscopic measurement; signal and noise ratio in emission, absorption and luminescent measurement; molecular and atomic spectroscopy, applications of spectroscopy technique in environmental, clinical and food

Course objectives:

1. To apply and integrate theory or reaction/interaction based on spectroscopic techniques to environmental, clinical and food areas (PLO 1,4)
2. To demonstrate and analyze data correctly based on spectroscopic techniques to related area/work according to research methodology and quality assurance (PLO 2,3,8)
3. To be able to communicate and present correctly and precisely (PLO 5)
4. To demonstrate behaviors of morality and research ethics (PLO 7)

Teaching Plan:

No.	Topics	Instructor	Duration	Score
1	UV-Visible Molecular Absorption Spectrometry - Principles and applications (15 h)	Dr. Panwadee Wattanasin	27/06/22 – 03/08/22 (Online and on-site)	33%
2	Atomic Absorption and Emission Spectrometry - Principles and applications (12 h)	Assoc.Prof.Dr. Thitima Rujiralai	05/08/22 – 02/09/22 (Online and on-site)	27%
3	Advanced Laser-based Spectroscopy Techniques: Principles and Applications - Fundamental of spectroscopy (0.5 h) - Introduction to laser and optics (0.5 h) - Laser-based spectroscopy techniques (2 h) (1) Laser-based absorption spectroscopy techniques (2) Laser-based fluorescence techniques (3) Laser-based Raman spectroscopy techniques	Prof.Dr. Jie Ma	05/09/22 – 07/09/22 (Online)	7%
4	Infrared Spectrometry and Molecular Luminescence Spectrometry - Principles and applications (15 h)	Asst.Prof.Dr. Supunnee Duangthong	09/09/22 – 14/10/22 (Online and on-site)	33%

Evaluation:

1. Active Learning: Answer questions/quiz/problem solving: 20%
2. Exam/Presentation/Report: 80%

References:

1. Harvey, D. **Modern Analytical Chemistry**, 1st ed., McGraw-Hill, Boston, 2000.
2. Atkins, P. and De Paula, J. **Atkins Physical Chemistry**, 8th ed., Oxford University Press, Oxford, 2006.
3. Rouessac, F. and Rouessac, A. **Chemical Analysis: Modern Instrumentation Methods and Techniques**, 2nd ed., John Wiley & Sons Ltd., West Sussex, 2007.
4. Articles in related journal such as Talanta, Journal of Analytical Atomic Spectrometry (JAAS), Analyst, RSC Advances, Analytical and Bioanalytical Chemistry.