

Module Description

MPK 2104 Chemical Separation Methods

Module Name	Chemical Separation Methods
Module Level, if applicable	Undergraduate Programme
Code, if applicable	MPK 2104
Subtitle, if applicable	-
Course, if applicable	-
Semester (s) in which the module is taught	4 th Semester
Module Coordinator (s)	Firman Shantya Budi, S.Pd., M.Sc
Lecturer	Titin Anita Zaharah, S.Si., M.Sc Firman Shantya Budi, S.Pd.,M.Sc,
Language	Bahasa Indonesia
Relation to curriculum	Compulsory course for the undergraduate programme in Chemistry
Type of teaching, contact hours	Decide teaching/training components for each course outcome ❖ Theory/face-to-face lecture (for understanding): 9 lecture meetings ❖ Seminar (for communication skills): 1 ❖ Problems: 2 ❖ Assignments: 2
Workload	(Estimated) Total workload: 2 x 2,83 hours = 5,66 hours per week. Contact hours (lecture): 2 x 0,83 hours = 1,66 hours per week Private study including examination preparation, specified in hours: 2 x 2 hours = 4 hours per week 2 x 50 minutes lectures, 2 x 60 minutes structured activity, 2 x 60 minutes individual activity, 14 weeks per semester, 80 total hours
Credit Points	2 (3.34 ECTS)
Requirements according to the examination	Registered in this course Minimum 75% attendance in this course

regulations	
Learning goals/competencies:	Intended Learning Outcomes (ILO) After taking this course, students will be able to: 1. LO-1 2. LO-3 3. LO-4
Module objectives	1. Students can explain the basic principles of various chemical separation techniques and the factors that influence their efficiency. 2. Students can analyze and apply extraction techniques to separate organic compounds, metals, and fluids based on their physicochemical properties. 3. Students can apply electrophoresis techniques to separate and characterize compounds based on their ionic mobility in an electric field. 4. Students can compare the working principles and applications of various chromatographic techniques, including paper, thin-layer, column, ion exchange, gel, gas, and high-performance liquid (HPLC) chromatography. 5. Students can evaluate the performance of chromatography techniques using quantitative parameters such as resolution, capacity factor, and column efficiency.
Content	1. Variety of separation techniques and basics 2. Extraction separation techniques 3. Extraction of organic compounds and metals and extraction of fluids 4. Electrophoresis 5. Introduction to chromatography 6. Paper chromatography and thin-layer chromatography 7. Open column chromatography 8. Ion exchange chromatography and gel filtration 9. Gas Chromatography 10. High-Performance Liquid Chromatography (HPLC) 11. Quantitative parameters of chromatography
Attribute Soft skill	Discipline, collaboration, responsibility, and argumentation in the natural classroom setting
Recommended prerequisites	-

Study and examination requirements and forms of examination	Students are considered to be competent and pass if they get at least 50% of the maximum final grade. The final grade (NA) is calculated based on the following : <table border="1" data-bbox="619 327 1174 698"> <thead> <tr> <th>Assessment Components</th><th>Percentage Contribution</th></tr> </thead> <tbody> <tr> <td>Participation</td><td>10%</td></tr> <tr> <td>Assignment</td><td>20%</td></tr> <tr> <td>Mid-semester test</td><td>35 %</td></tr> <tr> <td>Final semester test</td><td>35%</td></tr> <tr> <td>Total</td><td>100%</td></tr> </tbody> </table> Mid and final semester tests are carried out as an essay exam.	Assessment Components	Percentage Contribution	Participation	10%	Assignment	20%	Mid-semester test	35 %	Final semester test	35%	Total	100%
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Learning Methods	Case-Based Teaching Method												
Media employed	Whiteboard, PowerPoint presentation, and e-learning system												
Reading list	1. Christian, Gary D. 2003. Analytical Chemistry. 6th ed. John Wiley & Sons, Inc 2. Skoog, D. A., West, D. M, Holler, F. J. 2022. Fundamentals of Analytical Chemistry. 10th ed. Saunders College Publishing. 3. Budhiraja, R.P. 2004. Separation Chemistry. New Age International (P) Ltd 4. Mendham, J., Denney, R. C, Barnes, J. D., Thomas, M. 2000. Vogel's Textbook of Quantitative Chemical Analysis. 7th ed. Pearson Education Limited 5. Harris, D.C., 2010. Quantitative Chemical Analysis. New York: W.H. Freeman and Company 6. Schenk, G.H. and Ebbing, D.D. 1976. Qualitative Analysis And Ionic Equilibrium. Boston: Houghton Mifflin Company												