Module Description
MPK 3105 Spectroscopic Methods

Module Name	**Spectroscopic Methods**
Module level, if applicable	Undergraduate Programme
Code, if applicable	MPK 3105
Subtitle, if applicable	-
Course, if applicable	-
Semester(s) in which the module is taught	5th Semester
Module coordinator(s):	Elliska Murni Harfinda, S.Si, M.Si.
Lecturer	Prof. Dr. Gusrizal, S.Si., M.Si. Dr. Lia Destiarti, S.Si, M.Si. Firman Shantya Budi, S.Pd., M.Sc. Elliska Murni Harfinda, S.Si, M.Si.
Language	Bahasa Indonesia
Relation to curriculum	Compulsory Courses 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: 3 x 2,83 hours = 8,49 hours per week.* *Contact hours (lecture): 3 x 0,83 hours = 2,49 hours per week* *Private study including examination preparation, specified in hours: 3 x 2 hours = 6 hours per week* *3 x 50 minutes lectures,* *3 x 60 minutes structured activity,* *3 x 60 minutes individual activity,* *14 weeks per semester,*

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<tr><td></td><td>119 total hours</td></tr>
<tr><td>Credit points</td><td>3 (5.01 ECTS)</td></tr>
<tr><td>Requirements according to the examination regulations</td><td>Registered in this course
Minimum 75% attendance in this course</td></tr>
<tr><td>Learning goals/competencies:</td><td>Intended Learning Outcomes (ILO)
After taking this course, students will be able to:
1. LO-1
2. LO-3</td></tr>
<tr><td>Module objectives</td><td>1. Students can explain absolute (conventional) and comparative (instrumental) measurements and basic aspects to understand the interaction between electromagnetic radiation and matter.
2. Students can explain the principles of use, instruments, and applications of atomic and molecular spectroscopy: UV-visible, infrared, mass, AAS, and AES.
3. Students can explain the principles of use, instruments, and applications of ^{1}H-NMR and ^{13}C-NMR.
4. Students can explain the principles of use, instruments, and applications of X-ray spectrophotometry and surface microscopy (SEM, TEM).</td></tr>
<tr><td>Content:</td><td>1. Interaction of Radiation and Matter
2. Ultraviolet-Visible Spectrometry
3. Atomic Absorption and Atomic Emission Spectrometry
4. Infrared Spectrometry
5. Mass Spectrometry
6. Nuclear Magnetic Resonance Spectroscopy
7. X-ray Spectrometry
8. Surface Characterization by Spectroscopy and Microscopy</td></tr>
<tr><td>Attribute Soft skill:</td><td>Discipline, collaboration, responsibility, and argumentation in the natural classroom setting</td></tr>
<tr><td>Recommended prerequisites</td><td>Atomic Structure</td></tr>
<tr><td>Study and examination requirements and forms of examination</td><td>Students are considered competent and pass if they at least get 50% of the maximum final grade. The final grade (NA) is calculated based on the following :
<table><tr><th>Assessment</th><th>Percentage</th></tr></table></td></tr>
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<tr><th>Components</th><th>Contribution</th></tr>
<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>
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Mid and final-semester tests are carried out as essay exams.
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<tr><td>Learning Methods</td><td>Case-Based Teaching Method</td></tr>
<tr><td>Media employed</td><td>Whiteboard, PowerPoint presentation, and e-learning system</td></tr>
<tr><td>Reading list</td><td>1. Skoog, D. A., West, D. M., Holler, F. J. 2022. Fundamentals of Analytical Chemistry. 10th ed. Saunders College Publishing.
2. Skoog, D.A., Holler, F.J,. Crouch, S.R. 2018. Principles of Instrumental Analysis. 7th ed. Cengage Learning.</td></tr>
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