



UNIVERSITAS NEGERI YOGYAKARTA
FACULTY OF MATHEMATICS AND NATURAL SCIENCES
DEPARTMENT OF CHEMISTRY
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Bachelor of Science in Chemistry

MODULE HANDBOOK

Module name:	Fundamentals of Analytical Chemistry						
Module level, if applicable:	Undergraduate						
Code:	KIM 6411						
Sub-heading, if applicable:	-						
Classes, if applicable:	2						
Semester:	3 rd						
Module coordinator:	Sunarto, M.Si						
Lecturer(s):	1. Sunarto, M.Si. 2. Regina Tutik Padmaningrum, M.Si. 3. Erfan Priyambodo, M.Si.						
Language:	Bahasa Indonesia and English						
Classification within the curriculum:	Compulsory Subject						
Teaching format / class hours per week during the semester:	<ul style="list-style-type: none"> • Lectures: 150 minutes lectures, 180 structured activities and 180 individual study per week • Laboratory work: 170 minutes includes the laboratory work and it's reporting per week 						
Workload:	Total workload of the activity is 181,33 hours per semester which consists of 150 minutes lectures, 180 structured activities and 180 individual study and also 170 minutes laboratory work with it's reporting per week for 16 weeks						
Credit points:	4 SKS (7 ECTS) with the details of 3 SKS (5 ECTS) lectures and 1 SKS (2 ECTS)						
Prerequisites course(s):	General Chemistry						
Course Outcomes	<p>After taking this course, the students are expected to be able to:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%; text-align: center;">CO1</td> <td>Apply basic concepts of analytical chemistry to solve chemical research problems through laboratory activities</td> </tr> <tr> <td style="text-align: center;">CO2</td> <td>Applying chemical analysis theory to overcome environmental problems</td> </tr> <tr> <td style="text-align: center;">CO3</td> <td>Applying analytical chemistry concepts to innovate in conducting chemical research</td> </tr> </table>	CO1	Apply basic concepts of analytical chemistry to solve chemical research problems through laboratory activities	CO2	Applying chemical analysis theory to overcome environmental problems	CO3	Applying analytical chemistry concepts to innovate in conducting chemical research
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CO2	Applying chemical analysis theory to overcome environmental problems						
CO3	Applying analytical chemistry concepts to innovate in conducting chemical research						
Content:	The basics of analytical chemistry include Chemistry Qualitative and Quantitative Analysis. Qualitative analysis is the identification of sample components with specific reagents. Quantitative analysis is the determination of quantities (grams, percent) by volumetric techniques. Lecture emphasizes the mastery of lecture material logically and scientifically and the ability to use scientific methods to solve						

	<p>problems faced by students.</p> <ul style="list-style-type: none"> • Qualitative analysis includes: Introduction (the nature of chemical analysis, the type of chemical reaction, the role of chemical analysis, and the steps in analysis), the properties of solutions, various concentrations of solutions and how they are made, chemical equilibrium solutions (acid-base equilibrium, complex, redox and electrochemical, precipitation), and Analysis of cations and anions. • Quantitative Analysis includes: Gravimetry, Acid-base Titration, Complex Formation Titration, Oxidation-reduction Titration, Precipitation Titration. • Also discussed is the accuracy, position, and error of the results of the analysis and statistical tests of the analysis (different tests with t-test, Anava 1 road, 2 roads). 															
Study / exam achievements:	<p>Attitude assessment is carried out at each meeting by observation and/or self-assessment techniques using the assumption that basically every student has a good attitude. The student is marked very good or not good attitude if they show it significantly compared to other students in general. The result of attitude assessment is not taken into account in the final grades, but as one of the requirements to pass the course. Students will pass from this course if at least have a good attitude. The final mark will be weight as follow:</p> <table border="1" data-bbox="621 1062 1430 1377"> <thead> <tr> <th>No</th> <th>CO</th> <th>Assessment Object</th> <th>Assessment Technique</th> <th>Weight</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>CO1, CO2, CO3,</td> <td>a. Assignments b. Activity c. Midterm Exam d. Final Exam e. Laboratory Activities</td> <td>Presentation / written test</td> <td>20% 10% 25% 25% 20%</td> </tr> <tr> <td colspan="4">Total</td> <td>100%</td> </tr> </tbody> </table>	No	CO	Assessment Object	Assessment Technique	Weight	1	CO1, CO2, CO3,	a. Assignments b. Activity c. Midterm Exam d. Final Exam e. Laboratory Activities	Presentation / written test	20% 10% 25% 25% 20%	Total				100%
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Total				100%												
Forms of media:	Handout, Board, LCD Projector, Laptop/Computer, Module, Laboratory Work equipment															
References:	<ul style="list-style-type: none"> • I Made Sukarna (2007). <i>Diktat Kimia Analisis 1. Analisis Kualitatif</i>. Jurusan Pendidikan Kimia FMIPA UNY • Cases, M. V., & Lopez-Lorente, A. I. (2017). <i>Foundations of analytical chemistry: A teaching learning approach</i>. Springer Nature. • MaHam, A., & Ham, B. M. (2015). <i>Analytical chemistry: A chemist and laboratory technician's toolkit</i>. John Wiley & Sons • Bassett, at all. (Revisers). (1978). <i>Vogel's Text Book of Quantitative Inorganic Analysis. Including Elementary Instrumental Analysis</i>. Fourth Ed. London and New York: Longman. • Day, R.A, Underwood, A.L. (1989). <i>Analisis Kimia</i> 															

