Diponegoro University
Faculty of Science and Mathematics
Undergraduate Program Of Chemistry

Module designation	**Analytical Chemistry 1 (KA1)**
Semester(s) in which the module is taught	2
Person responsible for the module	Drs. Abdul Haris, M.Si Dr. M. Cholid Djunaidi,M.Si Dr. Gunawan, M.Si
Language	Indonesian
Relation to curriculum	Compulsory/~~elective~~/~~specialisation~~
Teaching methods	Lecture
Workload (incl. contact hours, self-study hours)	Face to face : 1 x (3 x 50 min); Structured study: 1 x (3 x 60 min); Self study: 1 x (3 x 60 min)
Credit points	3
Required and recommended prerequisites for joining the module	KU, KD1

Module objectives/intended learning outcomes	Demonstrate a responsible attitude towards work in their field of expertise independently. Able to demonstrate independent, quality, and measurable performance. Able to produce the correct conclusions based on the interpretation of the chemical analysis that has been done. Able to analyze several alternative solutions in spectrometric analysis and present analysis conclusions for appropriate decision making. They are mastering the theoretical concepts of structure, properties, changes, kinetics, and energetics of molecules and chemical systems, identification, separation, characterization, transformation, synthesis of macromolecular chemicals, and their application. Students can rationalize (C4) the most suitable instrumental analysis method in solving (C4) problems based on spectrometry and microscopy and can develop/modify (A4) new systems to obtain reliable chemical quantization.

Content	1. Introduction to Analytical Chemistry: Introduction to classical and modern chemical analysis in general 2. Introduction to Analytical Chemistry: Fundamentals of qualitative analysis, Electrolyte dissociation/ionization 3. Equilibrium constant: Equilibrium Theory 4. Acid-Base Equilibrium, salt, water and buffer buffer: acid base balance, salt balance, buffer balance (case method and project based learning) 5. Equilibrium of the precipitation reaction, and constant product solubility (Ksp) (case method and project based learning) 6. Equilibrium precipitation reaction, and constant product solubility (Ksp): application in analysis (case method and project based learning) 7. Equilibrium of the precipitation reaction, and the formation constant and instability of the complex: Stability, Kinst, Formation of complexes from sediment (case method and project based learning) 8. The equilibrium of the reduction–oxidation (Redox) reaction, and the redox constant 9. Qualitative chemical analysis based on flame reaction and charcoal reaction: qualitative chemical analysis based on flame reaction, qualitative chemical analysis based on charcoal reaction 10. Cation separation based on the H_2S method: Introduction to H_2S . method, Separation of Group I cations 11. Cation separation based on the H_2S method: The principle of group II cations A and B, Separation of Group III A and B . cations, Separation of Group IV cations 12. Cation separation based on the H_2S method: Separation of Group V . cations, separation of mixed cations, separation with other methods (case method and project based learning) 13. Separation Method and Anion Analysis 14. Method of separation and analysis of cation and anion mixtures (case method and project based learning)
Exams and assessment formats	Mid-Semester Exam and Final Exam
Study and examination requirements	Participatory Activities -20% Project Results -30% Task -10% Quiz -10% Mid-semester -15% Final exams -15%
Reading list	1. Vogel's , 1995, Qualitative Inorganic Analysis 2. Emil J.Slewinski, 1988, Chemical Principles in the Laboratory with Qualitative Analysis