

Module Handbook

Module Name:	General Chemistry 2A
Module Level:	Bachelor
Abbreviation, if applicable:	KI 1201
Sub-heading, if applicable:	
Courses included in the module, if applicable:	
Semester/term:	First year
Module coordinator(s):	
Lecturer(s):	
Language:	Bahasa Indonesia
Classification within the curriculum:	General Studies / Major Subject / Elective Studies
Teaching format / class hours per week during the semester:	3 hours lectures, 1 hour tutorial, 3 hours experimental works.
Workload:	3 hours lectures, 4 hours tutorial and experimental works, 3 hours individual study per week, 16 weeks per semester, and total 160 hours a semester
Credit Points:	3
Requirements:	-
Learning goals/competencies:	<ul style="list-style-type: none"> • Knowledge <ul style="list-style-type: none"> – Understand the formation of solution and heat of solution, solubility, Henry's law, concentration units, colligative properties. – Understand the factors that affect reaction rates, rate laws and integrated laws, mechanism of reaction. – Understand the laws of equilibrium and Le Chatelier principles. – Identify the acid-base properties of a molecule. – Understand the pH concept, equilibrium properties of acid-base in solution and principles of acid-base titration. – Identify the solubility of various compound and understand the selective precipitation – Understand the galvanic cell, electrolysis cell, concept of reduction potential and practical application of electrochemistry. – Understand the concept of nuclear binding energy, nuclear instability and radiation. – Identify the organic and biochemistry compounds, polymers, nucleic acid. • Skills <ul style="list-style-type: none"> – To use and converse various concentration units. – To determine the reaction mechanism. – To determine equilibrium constant and concentration at equilibria. – To determine the strength of acid and base compounds, concentration at equilibria state and using acid-base titration methods. – To determine the solubility of various compound and use selective precipitation principle to separate various ions and compounds. – To use electrochemical properties of compounds to obtain electrical energy and to modify some materials properties. – To determine the unstable nuclei and the radiation types that were emitted from unstable nuclear.

	<ul style="list-style-type: none"> – To be able to identify various organic and biochemical compound. • Competences <ul style="list-style-type: none"> – Reason the interaction among the molecules that form solution and use it to predict the properties of solution. – Reason the rate laws and construct the mechanism of reactions. – Reason the nature of acid-base properties and determine the acidity or basicity of a compound. – To be able to use oxidation and reduction properties of atoms and compounds explain the change of compound connected with the electron movements. – Reason the nuclear instability and activities. – Reason the properties of organic and biochemical compounds from its structural properties.
Content:	Physical properties of solution, Chemical equilibrium, Molecular concept of acid and base, Acid-base equilibria, Solubility and simultaneous equilibria, Electrochemistry, Nuclear chemistry, Organic and biochemical chemistry.
Study/exam achievements:	Students are considered to be competent and pass if at least get 48% of maximum mark of the exams and tasks. Final grades are calculated from 40% of mid- term exam, 40% of end semester exam, 10% of quizzes and 10% of experimental works.
Forms of Media:	Slides, Beamer, boards, internet, exercises, laboratory.
Literature:	<ol style="list-style-type: none"> 1. James E. Brady, Neil D. Jespersen and Alison Hyslop, Chemistry 6th Edition, John Wiley and Sons, 2012. 2. Raymond Chang, Chemistry 10th Edition, McGraw-Hill, 2010.