Module Handbook

Module Name:	General Chemistry 1A
Module Level:	Bachelor
Abbreviation, if applicable:	KI 1101
Sub-heading, if applicable:	
Courses included in the module, if applicable:	
Semester/term:	First year
Module coordinator(s):	Dr. Bambang Prijamboedi
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:	• Knowledge – Identify the atoms, elements, ionic compounds, molecular compounds. – Understand the concept of mole, limiting reactions and reaction yields. – Indentify electrolytes, acids and bases, and understand the acid-base nomenclature, molarities and reactions in solution. – Identify the oxidation and reduction reactions. – Understand the concept of energy and its relation with the chemical change, works, internal energy, first law of thermodynamics, Hess's law. – Understand the concept of entropy, second and third law of thermodynamics, Gibbs free energy, bond energy. – Understand the atomic spectra, the Bohr theory, wave model of atom, spin, atomic orbital. – Identify ionic bonding, covalent bonding and understand the concept of polar molecule, Lewis structure. – Identify the geometry of molecular structure, bonding types in molecules and matters. – Understand the ideal and real gas law, Dalton's gas law. – Understand the intermolecular forces in materials, Le chatelier principle. – Indentify the structure of crystalline solids, crystal types and its physical properties. • Skills – To determine the relation between chemical reactions in molecular scale and macroscopic scale such as mass, empirical and molecular formula. – To use titration methods and several chemical analyses to solve some problems related to the solution properties. – To balancing the oxidation-reduction reactions and calculate the mass involved in the oxidation-reduction reaction. – To determine the amount of heat that related to a chemical reaction – To determine the molecular structure and its geometry for a chemical

	compound. • Competences – Reason the relation between microscopic world in molecular level and macroscopic level through the mole and stoichiometry concepts, theory and description of atoms and molecules and its relation with the properties of materials. – To be able to use some basic chemical analytical method to understand and explain some chemical phenomena and also to indentify the chemical properties of common chemical substances.
Content:	Atoms, elements and compounds; Concepts of mole and stoichiometry; Reaction in aqueous solution; Oxidation-reduction reactions; Energy and chemical reaction; Thermodynamics; Theory of atoms based on quantum mechanics; Chemical bonding; Molecular structure; Properties of gases; Intermolecular force and properties of liquids and solids.
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:	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.