

## MODULE HANDBOOK

Module Name	Basic Chemistry I
Module level	Bachelor
Abbreviation, if applicable	8420403123
Sub-heading, if applicable	-
Course included in the module, if applicable	-
Semester/term	1 <sup>st</sup> /First Year
Module coordinator(s)	Dr. Harun Nasrudin,M.S.
Lecturer(s)	Dr. Harun Nasrudin,M.S.; Dr. Utiya Azizah, M.Pd.; Rusly Hidayah, S.Si., M.Pd.; Prof. Suyatno, M.Si.; Dr. Maria Monica SBW, M.Si.; Dr. Nuniek Herdyastuti, M.Si.; Dr. Amaria, M.Si., Prof. Sari Edy C. M.Si.
Language	Indonesian
Classification within the curriculum	Compulsory Course
Teaching format/class hours per week during the semester:	3 hours lecturers (50 min per hours)
Workload:	1 CU for bachelor degree equals to 3 workhours per week or 170 minutes (50' face to face learning, 60' structured learning, and 60' independent learning). In one semester, courses are conducted in 14 weeks (excluding mid and end-term exam). Thus, 1 CU equals to 39.67 workhours per semester. One CU equals to 1.59 ECTS.
Credit points:	3 CU = 3 x 1.59 = 4.77 ECTS
Prerequisites course(s):	-
Targeted learning outcomes:	<p>CLO 1 Students have the ability to utilize learning resources and ICT to support mastery of concepts and theories of the scientific method, material properties, stoichiometry, atomic structure, system periodic Elements, chemical bonds, energetics, and solutions.</p> <p>CLO 2 Students have the ability to make decisions about the relationship of basic concepts chemistry with laboratory activities and presence chemistry in everyday life.</p> <p>CLO 3 Students have knowledge of the scientific method, material properties, stoichiometry, atomic structure, system periodic elements, chemical bonds, energetics, and solutions.</p> <p>CLO 4 Students have the ability to have an honest and responsible attitude in carry out lectures and practicum.</p>
Content:	<p><b>Introduction:</b> The stages of the scientific method, Chemistry as a scientific activity, material and energy, extensive and intensive properties, chemical and physical properties, elements, compounds, and mixtures</p> <p><b>Stoichiometry:</b> Basic Chemistry Law, Atoms and Molecules, Mole Concepts, Avogadro Constanta, Compound Formulas, Chemical Reactions and Equalization, Polarity and Equivalent</p>

	<p><b>Atomic Structure:</b> Basic Particles, Hydrogen Atom Spectrum and Rutherford Atomic Model, Bohr Atomic Model, Atomic Wave Mechanics Model, Electron Configuration</p> <p><b>Periodic System of Elements:</b> Development of the Periodic System, Periodic System and Electron Configuration, Periodicity Properties (Atomic Radius, Ionization Energy, Electron Affinity, and Electronegativity)</p> <p><b>Chemical Bonds:</b> Ion Bonds, Covalent Bonds, Molecular Structures, Metal Bonds, and Chemical Styles (London Style v.d Waals, Hydrogen Bonds,)</p> <p><b>Energetics:</b> Several Terms (Systems, environment, state functions, adiabatic processes, isotherm processes, work, heat capacity, etc.), Law I Thermodynamics, Hess Law, Bonding Energy, Thermochemistry, Law II Thermodynamics, Entropy, Free Energy.</p> <p><b>Solution:</b> Electrolyte and non-electrolyte solution, colligative properties, acid-base, pH of solution, hydrolysis, namesake ion, buffer solution, and titration.</p>
Study / exam achievements:	<p>Students are considered to be competent and pass if at least get 55</p> <p>Final score is calculated as follows: 20% practicum + 30% assignment + 20% middle exam (UTS) &amp; 30% final exam (UAS)</p> <p>Table index of graduation</p> <ul style="list-style-type: none"> <li>• A = 4 (85 ≤ - &lt; 100)</li> <li>• A- = 3,75 (80 ≤ - &lt; 85)</li> <li>• B+ = 3,5 (75 ≤ - &lt; 80)</li> <li>• B = 3 (70 ≤ - &lt; 75)</li> <li>• B- = 2,75 (65 ≤ - &lt; 75)</li> <li>• C+ = 2,5 (60 ≤ - &lt; 65)</li> <li>• C = 2 (55 ≤ - &lt; 60)</li> <li>• D = 1 (40 ≤ - &lt; 55)</li> <li>• E = 0 (0 ≤ - &lt; 40)</li> </ul>
Media:	Computer, LCD, White board
Learning Methods	Individuals assignment, group assignment, discussion, presentation, and practicum
Literature:	<ol style="list-style-type: none"> <li>1. Tim Kimia Dasar. 2017. <i>Kimia Dasar I</i>. Surabaya: Unesa University Press.</li> <li>2. Brady and Humiston. 2004. <i>General Chemistry, Principles and Structures</i>. New York: John Willey and Sons.</li> <li>3. Chang, Raymond. 2005. <i>General Chemistry The Essential Concepts Third Edition</i>. USA: McGraw Hill.</li> <li>4. Achmad, Hiskia dan Tupamahu. 1990. <i>Penuntun Belajar Struktur Atom, Struktur Molekul, Sistem Periodik</i>. Bandung: ITB.</li> <li>5. Achmad, Hiskia dan Tupamahu. 1991. <i>Stoikiometri dan Energetika Kimia</i>, Bandung, PT Citra Aditya Bakti.</li> </ol>

	6. Ahmad, Hiskia. 1990. <i>Kimia Larutan</i> . Bandung: Jurusan Kimia FMIPA ITB
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