MINISTRY OF EDUCATION, CULTURE, RESEARCH, AND TECHNOLOGY
UNIVERSITAS NEGERI SURABAYA
FACULTY OF MATHEMATICS AND NATURAL SCIENCES
DEPARTMENT OF CHEMISTRY
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MODULE HANDBOOK

Module Name:	Basic Chemistry 1
Module level:	Bachelor
Course Code:	8420403123
Abbreviation, if applicable:	-
Course included in the module, if applicable:	-
Semester/term:	1st/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:	3 x 50 minutes lectures, 3 x 60 minutes structured activity, 3 x 60 minutes individual activity, 14 weeks per semester, 119 total hours per semester ~ 4.77 ECTS**
Credit unit:	3 CU = 3 x 1.59 = 4.77 ECTS
Prerequisite course(s):	-
Targeted learning outcomes:	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. 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. CLO 3 Students have knowledge of the scientific method, material properties, stoichiometry, atomic structure, system periodic elements, chemical bonds, energetics, and solutions. CLO 4 Students have the ability to have an honest and responsible attitude in carry out lectures and practicum.
Content:	**Introduction**: 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 **Stoichiometry:** Basic Chemistry Law, Atoms and Molecules, Mole Concepts, Avogadro Constanta, Compound Formulas,

<table>
<tr><td></td><td>Chemical Reactions and Equalization, Polarity and Equivalents
Atomic Structure: Basic Particles, Hydrogen Atom Spectrum and Rutherford Atomic Model, Bohr Atomic Model, Atomic Wave Mechanics Model, Electron Configuration
Periodic System of Elements: Development of the Periodic System, Periodic System and Electron Configuration, Periodicity Properties (Atomic Radius, Ionization Energy, Electron Affinity, and Electronegativity)
Chemical Bonds: Ion Bonds, Covalent Bonds, Molecular Structures, Metal Bonds, and Chemical Styles (London Style v.d Waals, Hydrogen Bonds,)
Energetics: 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.
Solution: Electrolyte and non-electrolyte solution, colligative properties, acid-base, pH of solution, hydrolysis, namesake ion, buffer solution, and titration.</td></tr>
<tr><td>Study / exam achievements:</td><td>The final grade (NA) is calculated based on the following ratio:
<table>
<tr><td>Assessment Components</td><td>Percentage of contribution</td></tr>
<tr><td>Participation</td><td>20%</td></tr>
<tr><td>Assignment</td><td>30%</td></tr>
<tr><td>Mid-semester test</td><td>20%</td></tr>
<tr><td>Final semester test</td><td>30%</td></tr>
</table>
Grade conversion of 0-100 scale into 0-4 scale is set as below:
<table>
<tr><td>Letter</td><td>Number</td><td>Grade Interval</td></tr>
<tr><td>A</td><td>4,00</td><td>$85 \leq A \leq 100$</td></tr>
<tr><td>A-</td><td>3,75</td><td>$80 \leq A- < 85$</td></tr>
<tr><td>B+</td><td>3,50</td><td>$75 \leq B+ < 80$</td></tr>
<tr><td>B</td><td>3,00</td><td>$70 \leq B < 75$</td></tr>
<tr><td>B-</td><td>2,75</td><td>$65 \leq B- < 70$</td></tr>
<tr><td>C+</td><td>2,50</td><td>$60 \leq C+ < 65$</td></tr>
<tr><td>C</td><td>2,00</td><td>$55 \leq C < 60$</td></tr>
<tr><td>D</td><td>1,00</td><td>$40 \leq D < 55$</td></tr>
<tr><td>E</td><td>0,00</td><td>$0 \leq E < 40$</td></tr>
</table></td></tr>
<tr><td>Media:</td><td>Computer, LCD, White board</td></tr>
<tr><td>Learning Methods:</td><td>Individuals assignment, group assignment, discussion, presentation, and practicum</td></tr>
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Literature:	1. Tim Kimia Dasar. 2017. *Kimia Dasar I* . Surabaya: Unesa University Press. 2. Brady and Humiston. 2004. *General Chemistry, Principles and Structures*. New York: John Willey and Sons. 3. Chang, Raymond. 2005. *General Chemistry The Essential Concepts Third Edition.* USA: McGraw Hill. 4. Achmad, Hiskia dan Tupamahu. 1990. *Penuntun Belajar Struktur Atom, Struktur Molekul, Sistem Periodik.* Bandung: ITB. 5. Achmad, Hiskia dan Tupamahu. 1991. *Stoikiometri dan Energetika Kimia*, Bandung, PT Citra Aditya Bakti. 6. Ahmad, Hiskia. 1990. *Kimia Larutan*. Bandung: Jurusan Kimia FMIPA ITB
Notes:	*1 credit unit or *sks* in learning process = three periods consist of: (a) scheduled instruction in a classroom or laboratory (50 minutes); (b) structured activity (60 minutes); and (c) individual activity (60 minutes) according to the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 44 Year 2015 jo. the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 50 Year 2018.
	**1 credit unit or *sks* = 1.59 ECTS according to Rector Decree Of Universitas Negeri Surabaya No. 598/UN38/HK/AK/2019