Module Descriptions

Module designation	General Chemistry *Kimia Dasar*
Course Code	8420503136
Semester/Term	1st Semester
Person responsible for the module	Prof. Dr. Harun Nasrudin,M.S. Prof. Suyatno, M.Si Dr. Rusly Hidayah, S.Si., M.Pd.
Language	Bahasa Indonesia (Indonesian language)
Relation to curriculum	Compulsory Course
Teaching method	Lectures
Workload	a. Contact hours 2 x 50 minutes lectures, 2 x 60 minutes structured activity, 1x170 minutes lab activity, 14 weeks per semester b. Individual study: 2 x 60 minutes individual activity, 14 weeks per semester, Total of lecture and lab activity= 119 total hours per semester ~ 4.77 ECTS**
Credit Point	3 Credit units (4.77 ECTS)
Required and recommended prerequisites for joining the module	-
Module Objectives/intended learning outcomes	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. *(Knowledge)* 2. Students have the ability to make decisions about the relationship of basic concepts chemistry with laboratory activities and presence chemistry in everyday life. *(Special Competence)* 3. Students have knowledge of the scientific method, material properties, stoichiometry, atomic structure, system periodic elements, chemical bonds, energetics, and solutions. *(General Competence)* *4.* Students have the ability to have an honest and responsible attitude in carry out lectures and practicum. *(Atittude)*

<table>
<tr><td>Content</td><td>1) 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;
2) Stoichiometry: Basic Chemistry Law, Atoms and Molecules, Mole Concepts, Avogadro Constanta, Compound Formulas, Chemical Reactions and Equalization, Polarity and Equivalents;
3) Atomic Structure: Basic Particles, Hydrogen Atom Spectrum and Rutherford Atomic Model, Bohr Atomic Model, Atomic Wave Mechanics Model, Electron Configuration;
4) 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,);
5) 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;
6) Entropy, Free Energy;
7) Solution: Electrolyte and non-electrolyte solution, colligative properties, acid-base, pH of solution, hydrolysis, namesake ion, buffer solution, and titration. Lecture activities are carried out in a student center with discussions, observations, and practicum.</td></tr>
<tr><td>Examination forms</td><td>Written exam</td></tr>
<tr><td>Study and examination requirements</td><td>Study Requirement

Attendance: students must attend at least 75% of the lectures to be eligible for the final examination.

Study examination

The final grade (NA) is calculated based on the following ratio:

<table>
<tr><td>Assessment Components</td><td></td><td>Percentage of contribution</td></tr>
<tr><td>Participation</td><td></td><td>20%</td></tr>
<tr><td>Assignment</td><td></td><td>30%</td></tr>
<tr><td>Mid-semester test</td><td></td><td>20%</td></tr>
<tr><td>Final semester test</td><td></td><td>30%</td></tr>
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<tr><td></td><td>Grade conversion of 0-100 scale into 0-4 scale is set as below:
<table>
<tr><th>Letter</th><th>Number</th><th>Grade Interval</th></tr>
<tr><td>A</td><td>4,00</td><td>85 ≤ A ≤ 100</td></tr>
<tr><td>A-</td><td>3,75</td><td>80 ≤ A- < 85</td></tr>
<tr><td>B+</td><td>3,50</td><td>75 ≤ B+ < 80</td></tr>
<tr><td>B</td><td>3,00</td><td>70 ≤ B < 75</td></tr>
<tr><td>B-</td><td>2,75</td><td>65 ≤ B- < 70</td></tr>
<tr><td>C+</td><td>2,50</td><td>60 ≤ C+ < 65</td></tr>
<tr><td>C</td><td>2,00</td><td>55 ≤ C < 60</td></tr>
<tr><td>D</td><td>1,00</td><td>40 ≤ D < 55</td></tr>
<tr><td>E</td><td>0,00</td><td>0 ≤ E < 40</td></tr>
</table></td></tr>
<tr><td>Reading List</td><td>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</td></tr>
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