UNIVERSITAS NEGERI YOGYAKARTA
FACULTY OF MATHEMATICS AND NATURAL SCIENCES
DEPARTMENT OF CHEMISTRY
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Bachelor of Science in Chemistry **MODULE HANDBOOK**

Module name:	Chemical Equilibrium
Module level, if applicable:	Undergraduate
Code:	KIM6405
Sub-heading, if applicable:	-
Classes, if applicable:	-
Semester:	4th
Module coordinator:	Dr. Isana Supiah Yosephine Louise, M.Si
Lecturer(s):	Dr. Isana Supiah Yosephine Louise, M.Si
Language:	Bahasa Indonesia and English
Classification within the curriculum:	Compulsory Subject
Teaching format / class hours per week during the semester:	• Lectures: 150 minutes lectures, 180 structured activities and 180 individual study per week • Laboratory work: 170 minutes includes the laboratory work and it's reporting per week
Workload:	Total workload of the activity is 181,33 hours per semester which consists of 150 minutes lectures, 180 structured activities and 180 individual study and also 170 minutes laboratory work with it's reporting per week for 16 weeks
Credit points:	4 SKS (7 ECTS) with the details of 3 SKS (5 ECTS) lectures and 1 SKS (2 ECTS)
Prerequisites course(s):	General Chemistry Mathematics for Chemistry
Course Outcome:	After taking this course, the students are expected to be able to: CO1 — Able to apply the theory of chemical balance to solve problems scientifically CO2 — Able to express thought patterns or ideas CO3 — Applying the concept of chemical balance to chemical research innovation
Content:	Chemical Equilibrium subjects discuss the concept of gas and its properties, the first law of thermodynamics and its application, thermochemistry, the second and third laws of thermodynamics and their application, chemical balance,

<table>
<tr><td></td><td>phase balance, physical properties of solutions, and electrochemical balance.
Learning Materials:
1. Gas and its properties
2. The First Law of Termodinamiaka
3. Thermochemistry
4. Second and Third Laws of the Law of Thermodynamics
5. Chemical Balance
6. Electrode balance
7. Solution
8. Phase Balance
9. Electrode balance
10. Properties of Solution Physics</td></tr>
<tr><td>Study / exam achievements:</td><td>Attitude assessment is carried out at each meeting by observation and/or self-assessment techniques using the assumption that basically every student has a good attitude. The student is marked very good or not good attitude if they show it significantly compared to other students in general. The result of attitude assessment is not taken into account in the final grades, but as one of the requirements to pass the course. Students will pass from this course if at least have a good attitude.
The final mark will be weight as follow:
<table>
<tr><th>No</th><th>CO</th><th>Assessment Object</th><th>Assessment Technique</th><th>Weight</th></tr>
<tr><td>1</td><td>CO1,
CO2,
CO3,</td><td>a. Assignments
b. Mid-term Semester
c. Final Exam
d. Activities
e. Practicum</td><td>Presentation / written test</td><td>30%
10%
20%
10%
30%</td></tr>
<tr><td colspan="4">Total</td><td>100%</td></tr>
</table></td></tr>
<tr><td>Forms of media:</td><td>Laboratory work materials and equipment, Board, LCD Projector, Laptop/Computer, Module</td></tr>
<tr><td>References:</td><td>1. Ijang Rohman dan Sri Mulyani. (2000). Kimia Fisika I. Bandung: IMSTEP JICA
2. Louis Jacob Bircher. (1942). Physical Chemistry, A Brief Course with Laboratory Experiments. New York: Prentice-Hall Inc
3. Howard DeVoe. (2015). Thermodynamics and Chemistry. New York: Prentice-Hall Inc.
4. David Ronis. (2015). Introductory Physical Chemistry I. Canada: McGill University</td></tr>
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PLO and CO mapping

	PLO									
	Attitude	General Skill		Knowledge				Specific Skill		
	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
CO1					√					
CO2							√			
CO3									√	