



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:	Physics for Chemistry
Module level, if applicable:	Undergraduate
Code:	KIM6302
Sub-heading, if applicable:	-
Classes, if applicable:	2
Semester:	1 st
Module coordinator:	Prof. Dr. Mundilarto
Lecturer(s):	1. Prof. Dr. Mundilarto 2. Rita Prasetyowati, S.Si., M.Si.
Language:	Bahasa Indonesia and English
Classification within the curriculum:	Compulsory Course
Teaching format / class hours per week during the semester:	<ul style="list-style-type: none"> • Lectures: 100 minutes lectures, 120 structured activities and 120 individual study per week • Laboratory work: 170 minutes includes the laboratory work and it's reporting per week
Workload:	Total workload is 136 hours per semester which consists of 150 minutes lectures, 180 structured activities, 180 individual study, and also 170 minutes laboratory work with it's reporting per week for 16 weeks
Credit points:	3 SKS (5 ECTS)
Prerequisites course(s):	-
Course Outcomes	<p>After taking this course, the students have ability to:</p> <p>CO1. Demonstrate piety and work ethics during the lectures and practicums</p> <p>CO2. Critically explain the basic concept of measurement in physics and its function on a daily basis</p> <p>CO3. Understand the concept of vector and implement the vector operation to solve problems in physics systematically</p> <p>CO4. Explain and implement the concept of kinematics and dynamics to solve problems of physics oriented to a daily life</p> <p>CO5. State the concept of constant and resilience, and analyze their functions on a real life</p> <p>CO6. Analyze the concept of heat and calculate coefficient of linear expansion, and implement their functions to solve problems in physics on a daily life</p> <p>CO7. Structurally analyze the concept of liquid surface tension and fluid mechanics related to physics</p> <p>CO8. Explain the concept, application, and function of static and dynamic equilibrium in a daily life</p> <p>CO9. Be independent when finishing structured activities and individual studies</p>

	<p>CO10. Be responsible when completing practicums</p> <p>CO11. Explain the law of thermodynamics (1-3) and its application to propose innovation in solving problems related to chemistry</p> <p>CO12. Systematically evaluate the law of thermodynamics (1-3) to bring innovation in solving problems related to chemistry</p>																																								
Content:	This course discusses the introduction to physics, vector analyses, kinematics, dynamics, constant and resilience, heat, coefficient of linear expansion, fluid mechanics, static and elastic equilibrium, the first law of thermodynamics, kinetic theory of gases, and the second law of thermodynamics.																																								
Study / exam achievements:	<p>The final mark will be weight as follow:</p> <table border="1"> <thead> <tr> <th>No</th> <th>CO</th> <th>Assessment Object</th> <th>Assessment Technique</th> <th>Weight</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>CO3, CO4, CO5, CO6, and CO7</td> <td>Individual study</td> <td>Tasks</td> <td>10%</td> </tr> <tr> <td>2</td> <td>CO10</td> <td>Practicum</td> <td>Observing practicum</td> <td>20%</td> </tr> <tr> <td>3</td> <td>CO6, CO7, CO8, CO11 and CO12</td> <td>Structured activities</td> <td>Observing presentation</td> <td>10%</td> </tr> <tr> <td>4</td> <td>CO1 and CO9</td> <td>Piety, work ethics and attitude in the learning process</td> <td>Observing attitude</td> <td>10%</td> </tr> <tr> <td>5</td> <td>CO2 and CO6</td> <td>Mid term</td> <td>Written test</td> <td>25%</td> </tr> <tr> <td>6</td> <td>CO2, CO3, CO4, CO5, CO6, CO7, CO8, CO11, and CO12</td> <td>Final term</td> <td>Written test</td> <td>25%</td> </tr> <tr> <td colspan="4" style="text-align: right;">Total</td> <td>100%</td> </tr> </tbody> </table>	No	CO	Assessment Object	Assessment Technique	Weight	1	CO3, CO4, CO5, CO6, and CO7	Individual study	Tasks	10%	2	CO10	Practicum	Observing practicum	20%	3	CO6, CO7, CO8, CO11 and CO12	Structured activities	Observing presentation	10%	4	CO1 and CO9	Piety, work ethics and attitude in the learning process	Observing attitude	10%	5	CO2 and CO6	Mid term	Written test	25%	6	CO2, CO3, CO4, CO5, CO6, CO7, CO8, CO11, and CO12	Final term	Written test	25%	Total				100%
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Forms of media:	Board, stationaries, LCD projector, PPT slides, and handouts																																								
Reference:	<p>A. Bastian E. Rapp, 2017 <i>Microfluidics: Modelling, Mechanics and Mathematics</i>. Elsevier</p> <p>B. Bahman Zohuri 2018. <i>Physics of Cryogenic. An Ultralow Temperature Phenomenon</i> 2018, Pages 259-298</p> <p>C. Kauzmann, Walter, 2012, <i>Kinetic theory of gases</i>, New York, NY : Dover Publications.</p> <p>D. Halliday, D., & Resnick, R. (1984). <i>Fisika Jilid I</i>. Translated by P. Silaban dan E. Sucipto. Jakarta: Erlangga.</p> <p>E. Djoniputro, B.D. (1985). <i>Teori Ketidakpastian</i>. Bandung: ITB</p> <p>F. Sutrisno. (1986). <i>Seri fisika dasar: Mekanika</i>. Bandung: ITB</p> <p>G. Sutrisno. (1986). <i>Seri fisika dasar: Listrik, magnet, dan</i></p>																																								

PLO and CO mapping

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
CO1		✓								
CO2							✓			
CO3							✓			
CO4							✓			
CO5							✓			
CO6							✓			
CO7							✓			
CO8							✓			
CO9		✓								
CO10		✓								
CO11									✓	
CO12									✓	

