



UNIVERSITAS NEGERI YOGYAKARTA
 FACULTY OF MATHEMATICS AND NATURAL SCIENCES
 DEPARTMENT OF CHEMISTRY
 1 Colombo Street Yogyakarta 55281
 Phone (0274) 565411, Ext. 1398, Fax (0274)548203
 Website: <http://kimia.fmipa.uny.ac.id>, E-mail: kimia@uny.ac.id

Bachelor of Science in Chemistry

MODULE HANDBOOK

Module name:	Mathematics for Chemistry						
Module level, if applicable:	Undergraduate						
Code:	KIM 6303						
Sub-heading, if applicable:	-						
Classes, if applicable:	2						
Semester:	1 st						
Module coordinator:	Dr. Suwardi						
Lecturer(s):	1. Dr. Suwardi 2. Heru Pratomo Al., M.Si. 3. Dewi Yuanita Lestari, M.Sc.						
Language:	Bahasa Indonesia and English						
Classification within the curriculum:	Compulsory Subject						
Teaching format / class hours per week during the semester:	150 minutes lectures, 180 structured activities and 180 individual study per week						
Workload:	Total workload is 136 hours per semester which consists of 150 minutes lectures, 180 structured activities and 180 individual study per week for 16 weeks						
Credit points:	3 SKS (5 ECTS)						
Prerequisites course(s):	-						
Course Outcome:	After taking this course, the students are expected to be able to: <table border="1" style="margin-left: 20px;"> <tr> <td>CO1</td> <td>Analyze the model of mathematics used to solving problem chemistry data research</td> </tr> <tr> <td>CO2</td> <td>able to process numerical data and information using the knowledge they have learned.</td> </tr> <tr> <td>CO3</td> <td>committed to understanding mathematical operations to facilitate their understanding related to mathematical operations.</td> </tr> </table>	CO1	Analyze the model of mathematics used to solving problem chemistry data research	CO2	able to process numerical data and information using the knowledge they have learned.	CO3	committed to understanding mathematical operations to facilitate their understanding related to mathematical operations.
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CO2	able to process numerical data and information using the knowledge they have learned.						
CO3	committed to understanding mathematical operations to facilitate their understanding related to mathematical operations.						
Content:	This course will also include the study about mathematical concepts and their applications in chemistry. The concept includes: coordinate systems, functions of one or more variables, differential-integrals, differential equations, determinants, operators and vectors and data processing. Coverage of the materials: 1. Numbers, measurements, and numerical mathematics 2. Mathematical symbols and mathematical functions 3. Completion of algebraic equations 4. Mathematical functions and differential calculus 5. Integral Calculus 6. Rank and transformation series						

	7. Calculus with several variables 8. Differential equations 9. Operators, matrices and group theory 10. Completion of simultaneous algebraic equations 11. Processing experimental data															
Course Outcome:	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 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>CO1, CO2, CO3,</td> <td>a. Assignments b. Mid-term Exam c. Final Exam d. Activities</td> <td>Presentation / written test</td> <td>40% 25% 25% 10%</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	CO1, CO2, CO3,	a. Assignments b. Mid-term Exam c. Final Exam d. Activities	Presentation / written test	40% 25% 25% 10%	Total				100%
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Total				100%												
Forms of media:	Handout, Board, LCD Projector, Laptop/Computer, Module															
References:	Barrante, J. R. (1998). Applied Mathematics for Physical Chemistry 3 rd Ed. New Jersey: Prentice Hall. Robert G. Mortimer, (2013), Mathematics for Physical 4 th Ed. Chemistry, Elsevier Inc. Steiner, E. (2015). The Chemistry Maths Book 2 nd ed. Oxford: Oxford University Press <i>Suggested Reading:</i> Kreyszig, Erwin. (2011). Advanced Engineering Mathematics 10 th Ed. New York: John Wiley. Boas, Marry. L. (2006). Mathematics for Physical Sciences. 3 rd Ed. New York: John Wiley.															

PLO and CO mapping

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