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

Module name:	**Mathematic for Chemistry**
Module level, if applicable:	Undergraduate
Code:	KIM 6304
Sub-heading, if applicable:	-
Classes, if applicable:	2
Semester:	2
Module coordinator:	Prof. Dr. Endang Widjajanti LFX
Lecturer(s):	**Dr. Suwardi, S.Si.,M.Si.;** Drs.Heru Pratomo Aloysius, M.Si.
Language:	Bahasa Indonesia and english
Classification within the curriculum:	Compulsory Course
Teaching format / class hours per week during the semester:	150 minutes lectures, 180 minutes structured activities, and 180 minutes individual study.
Workload:	Total workload is 136 hours per semester which consists of 150 minutes lectures, 180 minutes structured activities, and 180 minutes individual study per week for 16 weeks.
Credit points:	3 SKS (4.92 ETCS)
Prerequisites course(s):	-
Course Outcome:	After taking this course, the students are expected to be able to: CO1. able to show a critical attitude and care about biodiversity. CO2. able to master the concept of biological characteristics as a science and core principles of biology related to objects (animals, plants, fungi, protists, monera, bacteria) at the level of organization of life, and biological problems and the application of biology to human life. CO3. able to apply the concepts and principles of biology in solving biological problems for human life
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. Coordinate systems 2. Mathematical symbols and mathematical functions 3. The solution of algebraic equations 4. Mathematical functions and differential calculus 5. Integral Calculus 6. Calculus with several independent variables

<table>
<tr><td></td><td>8. Differential equations
9. Operators, matrices, determinant, and group theory
10. The solution of simultaneous algebraic equations
11. The treatment of experimental data</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>Assignments
Mid-term Exam
Final Exam
Activities</td><td>Presentation / written test</td><td>40%
25%
25%
10%</td></tr>
<tr><td colspan="4">Total</td><td>100%</td></tr>
</table></td></tr>
<tr><td>Forms of media:</td><td>Handout, Board, LCD Projector, Laptop/Computer, Module</td></tr>
<tr><td>References:</td><td>Barrante, J. R. 1998. Applied Mathematics for Physical Chemistry. New Jersey: Prentice Hall.
Robert G. Mortimer, 2005, Mathematics for Physical Chemistry, Elsevier Inc.
Kreyszig, Erwin. 1994. Advanced Engineering Mathematics. New York : John Wiley.
Boas, Marry. L. 1996. Mathematics for Physical Sciences. New York: John Wiley.
Doggett, Sutcliffe. 1996. Mathematics for chemistry, Harlow, Longman
Parker. J.E. 2013. Advanced Maths for chemist,Edinburg, Ventus Publishing ApS
Martin Cockett and Graham Doggett. 2003. Maths for Chemists. Cambridge, The Royal society of Chemistry
P. Ghosh. 2019. Impulsive differential equation model in methanol poisoning detoxification. Journal of Mathematical Chemistry
Alicia Cordero. 2020. Some variants of Halley’s method with memory and their applications for solving several chemical problems. Journal of Mathematical Chemistry
Dmitry Gromov. 2020. On an alternative formulation of the thermodynamic stability condition. Journal of Mathematical Chemistry</td></tr>
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PLO and CO mapping

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