Module Description

MPK 1006 Advanced Mathematics

Module Name	Advanced Mathematics
Module Level, if applicable	Undergraduate Programme
Code, if applicable	MPK 1006
Subtitle, if applicable	-
Course, if applicable	-
Semester (s) in which the module is taught	2nd Semester
Module Coordinator (s)	Ferdinand Hidayat, S.Si, M.Si
Lecturer	Ferdinand Hidayat, S.Si, MSi Berlian Sitorus, S.Si, M.Si, M.Sc, Ph.D
Language	Bahasa Indonesia
Relation to curriculum	Compulsory course for the undergraduate program in Chemistry
Type of teaching, contact hours	Decide teaching/training components for each course outcome ● Theory/face-to-face lecture (for understanding): 9 lecture meetings ● Seminar (for communication skills) : 1 ● Problem: 2 ● Assignments: 2
Workload	(Estimated) Total workload: 2 x 2,83 hours = 5,66 hours per week. Contact hours (lecture): 2 x 0,83 hours = 1,66 hours per week Private study including examination preparation, specified in hours: 2 x 2 hours = 4 hours per week 2 x 50 minutes lectures, 2 x 60 minutes structured activity, 2 x 60 minutes individual activity, 14 weeks per semester, 80 total hours
Credit Points	2 (3.34 ECTS)
Requirements according to the examination	Registered in this course Minimum 75% attendance in this course

regulations	
Learning goals/competencies:	**Intended Learning Outcomes (ILO)** After taking this course, students will be able to: 1. LO-1 2. LO-6
Module objectives	1. Students can explain mathematical functions, algebra, and vectors to solve algebraic equations, and apply them in chemistry 2. Students can explain derivative calculus and integral calculus, with several free variables, and apply them in chemistry 3. Students can explain mathematical series, function series, integral transformations, and differential equations, and apply them in chemistry 4. Students can explain operators, matrices, group theory, and statistical probability, and apply them in chemistry
Content	1. Mathematical Functions 2. Algebra 3. Vectors & Vector Algebra 4. Solving Algebraic Equations 5. Derivative Calculus 6. Integral Calculus 7. Derivative Calculus with several independent variables 8. Integral Calculus with several independent variables 9. Mathematical Series 10. Function Series and Integral Transformations 11. Differential Equations 12. Operators, Matrices, and Group Theory 13. Probability and Statistics
Attribute Soft skill	Discipline, collaboration, responsibility, and argumentation in the natural classroom setting
Recommended prerequisites	-
Study and examination requirements and forms of examination	Students are considered competent and pass if they at least get 50% of the maximum final grade. The final grade (NA) is calculated based on the following : | Assessment Components	Percentage Contribution | |---|---| | Participation | 10% | | Assignment | 20% |

	Mid-semester test	35 %
	Final semester test	35%
	Total	**100%**
	Mid and final semester tests are carried out as essay exams.	
Learning Methods	Case-Based Teaching Method	
Media employed	Whiteboard, PowerPoint presentation, and e-learning system	
Reading list	1. Mortimer, R.G., 2013, **Mathematics For Physical Chemistry, 4th Edition**, Elsevier, USA	