MODULE HANDBOOK

Module Name	Mathematics For Chemistry
Module level	Bachelor
Abbreviation, if applicable	3034213020
Sub-heading, if applicable	-
Course included in the module, if applicable	-
Semester/term	3rd/Second Year
Module coordinator(s)	Dr. Nuniek Herdyastuti, M.Si
Lecturer(s)	Dr. Pirim Setiarso, M.Si
Language	Indonesian
Classification within the curriculum	Compulsory Course
Teaching format/class hours per week during the semester:	3 hours lecturers (50 min per hours)
Workload:	1 CU for bachelor degree equals to 3 workhours per week or 170 minutes (50' face to face learning, 60' structured learning, and 60' independent learning). In one semester, courses are conducted in 14 weeks (excluding mid and end-term exam). Thus, 1 CU equals to 39.67 workhours per semester. One CU equals to 1.59 ECTS.
Credit points:	3 CU = 3 x 1.59 = 4.77 ECTS
Prerequisites course(s):	Basic Mathematics
Targeted learning outcomes:	CLO 1 Students have Capable to demonstrate knowledge related to theoretical concepts about structure, dynamics, and energy, as well as the basic principles of separation, analysis, synthesis and characterization of chemicals
Content:	**Introduction**: Briefly discuss the subject of mathematics for chemistry. **Functions and Limits** **Concept of differential** **Calculus of differential** **Integral concept** **Integration methods** **Improper integrals** **Line integral and integral fold** **Operator** **Matrices:** The definition of a matrix, matrix operations include addition of matrices, subtraction of matrices, multiplication of matrices and transpose matrix and properties as well as inverse matrix by Gauss substitution. Applied of matrices to solve problems in chemistry such as reaction stoichiometry, redoxs reactions and quantitative analysis as well. **Determinants** include the definition of the matrix determinant and its properties as well as the minors and cofactors related to adjoint matrices and inverse matrices.

	Applied of the determinant matrices for quantitative analysis and determining the eigenvalues of the Schodinger equation phi electron energy in chemical compounds with double bonds **Differential equation**: Definition of a differential equation, Differential equation with separate variables Homogeneous differential equations Exact Differential Equations Inexact differential equations Level 1 Linear Differential Equations Bernauli Differential Equations Level n Linear Differential Equations **Vector and tensor** **Sequence and series** **Special functions** **Fourier and Laplace transforms**
Study / exam achievements:	Students are considered to be competent and pass if at least get 55 Final score is calculated as follows: 20% participation + 30% assignment + 20% middle exam (UTS) & 30% final exam (UAS) Table index of graduation • A = 4 (85 ≤-≥ 100) • A- = 3,75 (80 ≤-< 85) • B+ = 3,5 (75 ≤- < 80) • B = 3 (70 ≤-< 75) • B- = 2,75 (65 ≤-<75) • C+ = 2,5 (60 ≤-<65) • C = 2 (55 ≤-<60) • D = 1 (40 ≤-<55) • E = 0 (0 ≤-<40)
Media:	Computer, LCD, White board
Learning Methods	Lectures and discussions, and working on problems
Literature:	1. Robert G Mortimer, 2005, Mathematics for Physical Chemistry, 3th ed, Elsevier Inc, USA. 2. Irwin Krizig, 1989, Advanced Mathematic for Physicist and Engineering, 4thed, John Wiley & Sons Inc, New York.