<table>
<tr><td colspan="2"> </td><td colspan="4">Faculty of Natural Sciences and Mathematics
Chemistry Department
Chemistry Education Study Program</td></tr>
<tr><td colspan="2">Module name</td><td colspan="4">Mathematics</td></tr>
<tr><td colspan="2">Module level, if applicable</td><td colspan="4">1st Year</td></tr>
<tr><td colspan="2">Code, if applicable</td><td colspan="4">SPK – 102</td></tr>
<tr><td colspan="2">Semester(s) in which the module is taught</td><td colspan="4">1st semester</td></tr>
<tr><td colspan="2">Person responsible for the module</td><td colspan="4">Basuki Abdurrahman, Drs., M.Si.</td></tr>
<tr><td colspan="2">Lecturer</td><td colspan="4">Basuki Abdurrahman, Drs., M.Si.</td></tr>
<tr><td colspan="2">Language</td><td colspan="4">Indonesia</td></tr>
<tr><td colspan="2">Relation to curriculum</td><td colspan="4">Compulsory</td></tr>
<tr><td>Teaching methods</td><td>Class size</td><td>Forms of active participation</td><td colspan="3">Workload 136 hours</td></tr>
<tr><td rowspan="3">Class discussion</td><td rowspan="3">50-60</td><td rowspan="3">Discussion</td><td>Lecture: 150 (min) x 16 (meeting)</td><td colspan="2">40 hours</td></tr>
<tr><td>Assignment: 180 (min) x 16 (week)</td><td colspan="2">48 hours</td></tr>
<tr><td>Independent study: 180 (min) x 16 (week)</td><td colspan="2">48 hours</td></tr>
<tr><td colspan="2">ECTS Credit</td><td colspan="4">4.86</td></tr>
<tr><td colspan="2">Credit points</td><td colspan="4">3 SCU</td></tr>
<tr><td colspan="2">Requirements according to the examination regulations</td><td colspan="4">Minimum attendance at lectures is 75% (according to UII regulation)</td></tr>
<tr><td colspan="2">Recommended prerequisites</td><td colspan="4">N/A</td></tr>
<tr><td colspan="2">Related course</td><td colspan="4"></td></tr>
<tr><td colspan="2">Module objectives/intended learning outcomes</td><td colspan="4">On successful completion of the course students should be able to:
1. Explain basic mathematical concepts
K-106-1A: explain the concept of the set of real numbers, Cartesian and polar coordinates, linear equations and determinants, sequence functions, limits, continuity, derivatives, theorem of mean value, Rolle's theorem, Taylor's theorem, extreme values, painting graphs, differentials, vector algebra, derivatives of vector functions.
K-106-1B: explain the concept of indefinite integral: integration methods (substitutions, partials, rational fractions, goniometric functions)</td></tr>
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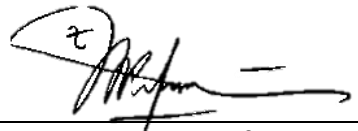
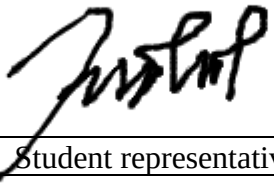
	K-106-1C: explain the concept of certain integrals (Riemann): integral as the limit of the number, the average value of integral K-106-1D: explain the concept of improper integrals, the use of integrals of flat area, arc length, the volume of rotating objects, areas of rotation, the centre of mass and moment of inertia, double integrals, and their use to understand theoretical concepts in chemistry (structures), changes in energy and kinetics. 2. Implement basic math on calculations K-106-2A: calculate cases related to the set of real numbers, Cartesian and polar coordinates, linear equations and determinants, sequence functions, limits, continuity, derivatives, mean value theorem, Rolle's theorem, Taylor's theorem, extreme values, painting graphs, differentials, vector algebra, derivatives of vector functions. K-106-2B: calculate Indefinite integrals: integration methods (substitutions, partials, rational fractions, goniometric functions) K-106-2C: calculate certain integrals (Riemann): integral as the limit of the number, the average value of the integral 3. K-106-2D: calculate improper integrals, use integrals of flat area, arc length, the volume of rotating objects, areas of rotation, the centre of mass and moment of inertia, multiple integrals, and their uses.
Content	• concept of the set of real numbers, Cartesian and polar coordinates, linear equations and determinants, sequence functions, limits, continuity, derivatives, theorem of mean value, Rolle's theorem, Taylor's theorem, extreme values, painting graphs, differentials, vector algebra, derivatives of vector functions. • concept of indefinite integral: integration methods (substitutions, partials, rational fractions, goniometric functions) • concept of certain integrals (Riemann): integral as the limit of the number, the average value of the integral concept of improper integrals, the use of integrals of flat area, arc length, the volume of rotating objects, areas of rotation, the centre of mass and moment of inertia, double integrals, and their use to understand theoretical concepts in chemistry (structures). , changes in energy and kinetics, characterization, etc.).
	Final score (NA) is calculated as follows:

Study and examination requirements and forms of examination	Intended learning outcomes	Weight (%)	Technique of assessment
	1	40	Written test: assignment, midterm
	2	60	Written test: assignment, final examination
Media employed	Power point slide presentation, video, Google classroom		
Reading list	Gowers, T., 2002, Mathematics: A Very Short Introduction, UK: Oxford University Press. Larson, R., and Edwards, B.H., 2009, Calculus, Cengage Learning. Pickover, C.A., 2012, The Math Book: From Pythagoras to the 57th Dimension, 250 Milestones in the History of Mathematics (Sterling Milestones). Sterling Publishing. Stewart, J., 2011, Calculus, Brooks Cole, 7 editions. Weiss, J., 2010, The Calculus Direct: An intuitively Obvious Approach to a Basic Understanding of the Calculus for the Casual Observer, Create Space.		

Prepared by:	Verified by:	Authorized by:
		
Person responsible for the module	Student representative	Coordinator Program