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Faculty of Mathematics and Natural Sciences
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MODULE HANDBOOK

Module designation	<i>Calculus 1</i>
Semester(s) in which the module is taught	1
Person responsible for the module	<i>Dr. Hengki Tasman</i>
Language	<i>Indonesian</i>
Relation to curriculum	<i>Compulsory</i> <i>The module is shared with Statistics, Actuarial Science, and Physics undergraduate study programs</i>
Teaching methods	<i>lecture, lab works</i>
Workload (incl. contact hours, self-study hours)	<i>(Estimated) Total workload: 9 hours/week x 14 weeks + 5.5 hours/week x 2 weeks = 137 hours.</i> <i>Contact hours: 3 hours (150 minutes lectures).</i> <i>Private study including examination preparation, specified in hours¹:</i> <i>3 hours structured activities and 3 hours individual study per week.</i>
Credit points	<i>3 SKS (4.77 ECTS)</i>
Required and recommended prerequisites for joining the module	-

¹ When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

<p>Module objectives/intended learning outcomes</p>	<p><i>After completing the course, students have the ability</i></p> <ol style="list-style-type: none"> 1. <i>To determine the solution set of inequalities involving absolute value,</i> 2. <i>To determine domain, codomain, range and operation of some one variable functions and the graphs,</i> 3. <i>To determine limit and continuity of one variable functions,</i> 4. <i>To determine derivate of one variable functions,</i> 5. <i>To determine the solution of problems involving the derivate of one variable function,</i> 6. <i>To determine proper integral of one variable functions,</i> 7. <i>To determine integral involving the fundamental theorem of Calculus and method of substitution,</i> 8. <i>To determine the solution of problems involving the integral of one variable function,</i> 9. <i>To determine inverse function and its derivate,</i> 10. <i>To compute derivate and integral involving transcendental functions,</i> 11. <i>To compute integral with advanced integration techniques.</i>
<p>Content</p>	<ol style="list-style-type: none"> 1. <i>Real number, inequalities, absolute value, Cartesian coordinate system, function and its graph, operation on function, trigonometry function.</i> 2. <i>Intuition, definition, theorems of limit, trigonometry function limit, limit on infinity, infinite limit, continuity function,</i> 3. <i>Definition and rule of derivate, derivate of trigonometry function, chain rule, higher order derivate, implicit derivate, related rate, basic concept of differential,</i> 4. <i>Maximum and minimum, monotonicity and concavity, local extreme, extreme value on open interval, graphing one variable function, mean value theorem for derivate, antiderivative,</i> 5. <i>Intuition of integral, proper integral, Fundamental Theorem of Calculus, method of substitution, Mean Value Theorem for integral, symmetries,</i> 6. <i>Area, solid revolution volume,</i> 7. <i>Natural logarithm function, inverse function and its derivate, natural exponential function, general exponential function, general logarithm function, hyperbolic function and its inverse,</i> 8. <i>Basic rules of integration, partial integration method, trigonometry integral, rationalizing substitution, integral of rational function with partial fraction.</i>

Examination forms	<ol style="list-style-type: none"> 1. <i>Class activities : Quiz (written and computer-based), homework.</i> 2. <i>Lab sessions</i> 3. <i>Mid-term examination</i> 4. <i>Final examination</i> 																				
Study and examination requirements	<p><i>The final mark will be weighted as follows:</i></p> <ol style="list-style-type: none"> 1. <i>Online Quiz (10%)</i> 2. <i>Homework (15%).</i> 3. <i>Written Quiz (10%)</i> 4. <i>Lab sessions (5%)</i> 5. <i>Mid-term examination (30%)</i> 6. <i>Final examination (30%)</i> <p><i>To successfully pass the module it requires minimum 55% of the total mark.</i></p> <table border="0" style="margin-left: 40px;"> <thead> <tr> <th style="text-align: left;"><i>Mark</i></th> <th style="text-align: left;"><i>Grade</i></th> </tr> </thead> <tbody> <tr><td>85—100</td><td>A</td></tr> <tr><td>80—<85</td><td>A-</td></tr> <tr><td>75—<80</td><td>B+</td></tr> <tr><td>70—<75</td><td>B</td></tr> <tr><td>65—<70</td><td>B-</td></tr> <tr><td>60—<65</td><td>C+</td></tr> <tr><td>55—<60</td><td>C</td></tr> <tr><td>40—<55</td><td>D</td></tr> <tr><td><40</td><td>E</td></tr> </tbody> </table>	<i>Mark</i>	<i>Grade</i>	85—100	A	80—<85	A-	75—<80	B+	70—<75	B	65—<70	B-	60—<65	C+	55—<60	C	40—<55	D	<40	E
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Reading list (resources)	<ol style="list-style-type: none"> 1. <i>Varberg, Dale; Edwin J. Purcell; Steven E. Rigdon. Calculus, 9th Edition, Prentice Hall Inc, 2007</i> 2. <i>Finney R. L., Weir M. D., Giordano F. R., Thomas' Calculus, 10th ed., Addison- Wesley Publishing Company, 2001</i> 3. <i>Lecturer's Handout</i> 4. <i>Videos</i> 																				