



UNIVERSITAS INDONESIA
Faculty of Mathematics and Natural Sciences
Department of Mathematics
Building D, Kampus UI Depok 16424, Telp: 021 - 7863439,
Email: sekretariat.math@sci.ui.ac.id, website: <https://www.math.ui.ac.id/>

MODULE HANDBOOK

Module designation	<i>Calculus 2</i>
Semester(s) in which the module is taught	2
Person responsible for the module	<i>Dr. Rahmi Rusin</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	<i>Calculus 1</i>

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 solve indeterminate forms and improper integral problems</i> 2. <i>to solve the parametric representation of curves in the plane, calculate the length of a plane curve and the area of a surface of revolution.</i> 3. <i>to sketch the graph of a polar equation, calculate the derivatives and the area problems in the polar coordinate system.</i> 4. <i>to determine the domain, codomain, range of functions of two or more variables, to do algebraic operations between them and sketch their graphs.</i> 5. <i>to determine the limit and continuity of a functions of two variables.</i> 6. <i>to evaluate the derivatives of functions of two or more variables.</i> 7. <i>to solve simple real problems related to derivatives of functions of two or three variables.</i> 8. <i>To calculate the integrals of functions of two or three variables.</i> 9. <i>To solve problems related to integral of functions of two or three variables.</i> 10. <i>To determine the convergence of infinite sequences.</i>
<p>Content</p>	<ol style="list-style-type: none"> 1. <i>Indeterminate forms and improper integrals.</i> 2. <i>Parametric representation of curves in the plane, the length of a plane curve and the area of a surface of revolution.</i> 3. <i>Polar coordinate systems, graphs of polar equations, and calculus in polar coordinate</i> 4. <i>Functions of two or more variables, partial derivatives, limit and continuity, differentiability, directional derivatives and gradient, the chain rule, and tangent planes and approximations.</i> 5. <i>Maxima dan minima and the Lagrange multiplier method.</i> 6. <i>Double integrals over rectangles, iterated integrals, and double integrals over nonrectangular regions.</i> 7. <i>Double integral in polar coordinates, applications of double integrals, and surface area.</i> 8. <i>Triple integrals in cartesian coordinates, triple integrals in cylindrical and spherical coordinates, and change of variables in multiple integrals.</i> 9. <i>Infinite sequences.</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 examinations (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
<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																				
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 (powerpoint)</i> 4. <i>Videos</i> 																				