



MINISTRY OF HIGHER EDUCATION, SCIENCE, AND
 TECHNOLOGY
 UNIVERSITAS NEGERI SURABAYA
 FACULTY OF MATHEMATICS AND NATURAL SCIENCES
 UNDERGRADUATE PROGRAM OF MATHEMATICS EDUCATION
 Ketintang Campus, Jalan Ketintang, C8 C9 Building, Surabaya 60231
 Phone: +62 895335466373, email: s1-pmat@unesa.ac.id
 Website: <https://pendidikan-matematika.fmipa.unesa.ac.id/>

Undergraduate Program of Mathematics

Module Handbook

Module Name:	Multiple Variable Calculus Kalkulus Peubah Banyak
Module Level:	Sarjana (S-1) / Undergraduate
Abbreviation, if applicable:	8420203086
Sub-heading, if applicable:	-
Course included in the module, if applicable:	-
Semester/term:	5 / Third year
Module Coordinator(s):	Dr. Siti Khabibah, M.Pd.
Lecturer(s):	Dr. Siti Khabibah, M.Pd. Rudianto Artiono, S.Pd., M.Si. Nina Rinda Prihartiwi, S.Pd., M.Pd. Yulia Izza El Milla, S.Pd., M.Pd.
Language:	Indonesia
Classification within the curriculum:	Compulsory course/ elective studies
Teaching format/class hours per week during the semester	Teaching format: lectures, tutorial assignment, and individual Study/3 x 170 minutes = 510 minutes = 8.5 hours lectures
Workload:	<p>16 weeks per semester consisting of:</p> <ul style="list-style-type: none"> • 1 hour lectures (1 x 50 minutes) per week, • 1 hours assignments (1 x 60 minutes) per week, ➤ 1 hours individual study (1 x 60 minutes) per week, <p>Total workload : 16x3x170 minutes = 8,160 minutes = 136 hours=4.8 ECTS*</p>
Credit Point:	3
Requirements:	Integral Calculus
Learning Goals :	PLO-5 : Possess basic mathematical knowledge to solve mathematical problems and their applications in education



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	<p>PLO-6 : Master the principles of mathematical knowledge to support mathematical thinking skills in solving mathematical problems</p>																																																																				
<p>Content:</p>	<p>Studying two- and three-dimensional vectors, real functions with two variables (definition, limit and continuity, partial derivatives, differential algebra and chain rule, higher-order partial derivatives, Taylor's theorem, maximum and minimum problems, Lagrange's method), vector-valued functions (definition, limits and continuity, partial derivatives, derivative algebra, higher-order partial derivatives, tensors), multiple integrals, line integrals through active learning aided by ICT using lecture, question and answer, and discussion methods.</p>																																																																				
<p>Study/exam achievements</p>	<ul style="list-style-type: none"> Students are considered competent and pass if the final score is at least 55 or C. Final score is calculated as follows: <table border="1" data-bbox="571 1081 1377 1928"> <thead> <tr> <th>Week</th> <th>Course Learning Outcomes (CLO)</th> <th>Programme Learning Outcomes (PLO)</th> <th>Evaluation (%)</th> </tr> </thead> <tbody> <tr><td>1</td><td>CLO-1</td><td>PLO-5</td><td>5</td></tr> <tr><td>2</td><td>CLO-1</td><td>PLO-5</td><td>5</td></tr> <tr><td>3</td><td>CLO-1</td><td>PLO-5</td><td>10</td></tr> <tr><td>4</td><td>CLO-2</td><td>PLO-5</td><td>5</td></tr> <tr><td>5</td><td>CLO-2</td><td>PLO-5</td><td>10</td></tr> <tr><td>6</td><td>CLO-3</td><td>PLO-6</td><td>5</td></tr> <tr><td>7</td><td>CLO-3</td><td>PLO-6</td><td>5</td></tr> <tr><td>8</td><td>CLO-3</td><td>PLO-6</td><td>10</td></tr> <tr><td>9</td><td>CLO-4</td><td>PLO-6</td><td>5</td></tr> <tr><td>10</td><td>CLO-4</td><td>PLO-6</td><td>5</td></tr> <tr><td>11</td><td>CLO-4</td><td>PLO-6</td><td>10</td></tr> <tr><td>12</td><td>CLO-4</td><td>PLO-6</td><td>5</td></tr> <tr><td>13</td><td>CLO-4</td><td>PLO-6</td><td>5</td></tr> <tr><td>14</td><td>CLO-4</td><td>PLO-6</td><td>5</td></tr> <tr><td>15</td><td>CLO-4</td><td>PLO-6</td><td>5</td></tr> <tr><td>16</td><td>CLO-4</td><td>PLO-6</td><td>5</td></tr> </tbody> </table> Final index is defined as follow: 	Week	Course Learning Outcomes (CLO)	Programme Learning Outcomes (PLO)	Evaluation (%)	1	CLO-1	PLO-5	5	2	CLO-1	PLO-5	5	3	CLO-1	PLO-5	10	4	CLO-2	PLO-5	5	5	CLO-2	PLO-5	10	6	CLO-3	PLO-6	5	7	CLO-3	PLO-6	5	8	CLO-3	PLO-6	10	9	CLO-4	PLO-6	5	10	CLO-4	PLO-6	5	11	CLO-4	PLO-6	10	12	CLO-4	PLO-6	5	13	CLO-4	PLO-6	5	14	CLO-4	PLO-6	5	15	CLO-4	PLO-6	5	16	CLO-4	PLO-6	5
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	Index	Converted Score	Score Range
	A	4.00	$85 \leq A \leq 100$
	A-	3.75	$80 \leq A- < 85$
	B+	3.50	$75 \leq B+ < 80$
	B	3.00	$70 \leq B < 75$
	B-	2.75	$65 \leq B- < 70$
	C+	2.50	$60 \leq C+ < 65$
	C	2.00	$55 \leq C < 60$
	D	1.00	$40 \leq D < 55$
	E	0.00	$0 \leq E < 40$
Forms of Media	Slides and LCD projectors, whiteboard		
Literature	<ol style="list-style-type: none"> 1. Stewart, J., 2012, Multivariable Calculus 7th edition, Brooks/Cole Publishing, California 2. Finney, Weir dan Giardano, 2001. Thomas' Calculus 10th, Addison-Wesley 3. Holder, L.I, DeFranza, J., dan Pasachoff, J. M.1994, Multivariable Calculus, Brooks/Cole Publishing, California. 4. Martono, K.,1992, Kalkulus Lanjut 1, ITB: Bandung. 		
Note	<p>Based on the regulation of the minister of education and culture of Indonesia number 3 of 2020 concerning national higher education standards, it is state 1 CU equals to 170 minutes per week. Therefore, in one semester (16 weeks, including midterm a final exam) $1 \text{ CU} = 170 \times 16 = 2.720$ minutes or 45.3 hours. Therefore, workhours in $144 \text{ CU} \times 45.3 \text{ hours} = 6.523,2$ hours. Unesa decided that 1 ECTS with 144 CU, $6.523,2/229 \text{ ECTS} = 28.48$ hours, so that $1 \text{ CU} = 1.59 \text{ ECTS}$</p>		