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/

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:	16 weeks per semester consisting of: • 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, Total workload : 16x3x170 minutes = 8,160 minutes = 136 hours=4.8 ECTS*
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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<table>
<tr><td></td><td>PLO-6 : Master the principles of mathematical knowledge to support mathematical thinking skills in solving mathematical problems</td></tr>
<tr><td>Content:</td><td>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.</td></tr>
<tr><td>Study/exam achievements</td><td>

Students are considered competent and pass if the final score is at least 55 or C.
Final score is calculated as follows:

<table>
<tr><th>Week</th><th>Course Learning Outcomes (CLO)</th><th>Programme Learning Outcomes (PLO)</th><th>Evaluation (%)</th></tr>
<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>
</table>

Final index is defined as follow:

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</table>

	<table><tr><th>Index</th><th>Converted Score</th><th>Score Range</th></tr><tr><td>A</td><td>4.00</td><td>$85 \leq A \leq 100$</td></tr><tr><td>A-</td><td>3.75</td><td>$80 \leq A- < 85$</td></tr><tr><td>B+</td><td>3.50</td><td>$75 \leq B+ < 80$</td></tr><tr><td>B</td><td>3.00</td><td>$70 \leq B < 75$</td></tr><tr><td>B-</td><td>2.75</td><td>$65 \leq B- < 70$</td></tr><tr><td>C+</td><td>2.50</td><td>$60 \leq C+ < 65$</td></tr><tr><td>C</td><td>2.00</td><td>$55 \leq C < 60$</td></tr><tr><td>D</td><td>1.00</td><td>$40 \leq D < 55$</td></tr><tr><td>E</td><td>0.00</td><td>$0 \leq E < 40$</td></tr></table>
Forms of Media	Slides and LCD projectors, whiteboard
Literature	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	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 CU = 170 X 16 = 2.720 minutes or 45.3 hours. Therefore, workhours in 144 CU x 45.3 hours = 6.523,2 hours. Unesa decided that 1 ECTS with 144 CU, 6.523,2/229 ECTS = 28.48 hours, so that 1 CU = 1.59 ECTS