<table>
<tr><td>Module designation</td><td>Multiple Variable Calculus
Indonesian title: Kalkulus Peubah Banyak
Course code: 8420203086</td></tr>
<tr><td>Semester(s) in which the module is taught</td><td>Semester 5 (Third year)</td></tr>
<tr><td>Person responsible for the module</td><td>Coordinator: Dr. Siti Khabibah, M.Pd.
Teaching staff: 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.</td></tr>
<tr><td>Language</td><td>Indonesian</td></tr>
<tr><td>Relation to curriculum</td><td>Compulsory</td></tr>
<tr><td>Teaching methods</td><td>Lectures, tutorial assignments, and individual study
Media and tools: Slides and LCD projectors, whiteboard</td></tr>
<tr><td>Workload (incl. contact hours, self-study hours)</td><td>(Estimated) total workload: 3 CU × 170 minutes × 16 weeks = 8,160 minutes = 136.00 hours (≈ 4.77 ECTS)
Contact hours: lectures, 3 × 50 minutes per week × 16 weeks = 40.00 hours (class hours per week: 510 minutes = 8.50 hours, including structured activities)
Private study including examination preparation: structured assignments, 3 × 60 minutes per week × 16 weeks = 48.00 hours; independent study, 3 × 60 minutes per week × 16 weeks = 48.00 hours (total 96.00 hours)</td></tr>
<tr><td>Credit points</td><td>3 CU (4.77 ECTS)
1 CU = 170 minutes per week × 16 weeks = 45.3 hours; 1 ECTS = 28.48 hours (144 CU = 229 ECTS), so 1 CU = 1.59 ECTS (UNESA Rector's Decree No. 736/HK/KM/2023).</td></tr>
<tr><td>Required and recommended prerequisites for joining the module</td><td>Integral Calculus</td></tr>
<tr><td>Module objectives/intended learning outcomes</td><td>Programme learning outcomes (PLO) addressed:
PLO-5: Apply the basic principles of mathematics to solve simple mathematical problems.
PLO-6: Demonstrate mathematical knowledge and insight.</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>Examination forms</td><td>Final score is calculated from the weekly assessment scheme below (CLO/PLO addressed and weight of each assessment):
<table>
<tr><th>Week</th><th>CLO</th><th>PLO</th><th>Weight (%)</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>
</table></td></tr>
</table>

	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

Study and examination requirements

Students are considered competent and pass if the final score is at least 55 or C.

Final index (grade conversion):

Index	Converted score	Score range (A = final score)
A	4.00	85 ≤ A ≤ 100
A-	3.75	80 ≤ A < 85
B+	3.50	75 ≤ A < 80
B	3.00	70 ≤ A < 75
B-	2.75	65 ≤ A < 70
C+	2.50	60 ≤ A < 65
C	2.00	55 ≤ A < 60
D	1.00	40 ≤ A < 55
E	0.00	0 ≤ A < 40

Reading list

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.