



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:	Matematika Kejuruan Vocational Mathematics
Module Level:	Sarjana (S-1) / Undergraduate
Abbreviation, if applicable:	8420202111
Sub-heading, if applicable:	-
Course included in the module, if applicable:	-
Semester/term:	4 / Second year
Module Coordinator(s):	Dr. Endah Budi Rahaju, M.Pd.
Lecturer(s):	Dr. Endah Budi Rahaju, M.Pd. Yulia Izza El Milla, M.Pd Dr. Abdul Haris Rosyidi, M.Pd.
Language:	Indonesia
Classification within the curriculum:	Compulsory course/ elective studies
Teaching format/class hours per week during the semester	Teaching format: interactive lectures using context-based learning, case-based learning, collaborative problem solving, technology-assisted exploration, group presentations, and an individual final project. Class hours per week: 2×170 minutes = 340 minutes (5.67 hours) of total learning workload, of which 2×50 minutes are scheduled lectures.
Workload:	16 weeks per semester consisting of: <ul style="list-style-type: none">• 2 credit-hours of lectures (2×50 minutes) per week,• 2 credit-hours of structured assignments (2×60 minutes) per week,• 2 credit-hours of independent study (2×60 minutes) per week, Total workload: $16 \times 2 \times 170$ minutes = 5,440 minutes = 90.67 hours = 3.18 ECTS*.
Credit Point:	2 CU (3.18 ECTS)
Requirements:	N/A



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Learning Goals :	<p>Programme Learning Outcomes (PLO) addressed:</p> <p>PLO-3: Develop logical, critical, systematic, and creative thinking in work within the relevant field of expertise and occupational competency standards.</p> <p>PLO-6: Master mathematical principles that support mathematical thinking and mathematical problem solving.</p> <p>PLO-7: Master pedagogical knowledge for teaching and assessment aligned with curriculum and technological developments, realistic mathematics education, and edupreneur-leadership.</p> <p>PLO-8: Demonstrate skills in designing, implementing, and evaluating adaptive, innovative, technology-supported mathematics learning.</p> <p>PLO-10: Make data-informed decisions in completing assigned tasks and evaluating completed work.</p> <p>Course Learning Outcomes (CLO): after completing this module, students are able to:</p> <p>CLO-1: Analyze essential vocational secondary school mathematics content and collaboratively develop systematic, creative teaching alternatives, with or without technology, informed by recent research.</p> <p>CLO-2: Identify mathematics topics that are difficult for SMK teachers to teach or students to learn, and collaboratively develop creative, technology-assisted instructional alternatives.</p> <p>CLO-3: Identify types and potential mathematical misconceptions among vocational secondary school students and design evidence-informed strategies to address them.</p>
Content:	<p>This course examines the essential mathematical concepts taught in Indonesian vocational schools and their connections to different vocational specializations and workplace practices. It covers numbers and exponents; sequences and series; financial mathematics (loans, investments, compound interest, and annuities); algebra, equations, and functions; geometry and trigonometry; data analysis, graphs, correlation, and regression;</p>



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probability and combinatorics; and measurement error, accuracy, and precision. Students analyze subject-specific contexts, identify difficult content and possible student misconceptions, evaluate teaching alternatives, and develop contextual, technology-supported learning activities. Case studies, collaborative analysis, individual assignments, presentations, and a final instructional design project are used to develop vocationally relevant mathematics teaching that fosters higher-order thinking.

**Study/exam
achievements**

- Students pass the course when the final score is at least 55 (C). Assessment follows the 16-week distribution in the supplied RPS: weekly analyses and assignments (68%), an individual written test (week 9: 12%), and an individual final instructional-design project (week 16: 20%), totalling 100%.
- Final score is calculated as follows:

Week	Course Learning Outcomes (CLO)	Programme Learning Outcomes (PLO)	Evaluation
1	CLO-1	PLO-3	3%
2	CLO-2	PLO-3	5%
3	CLO-2	PLO-3	5%
4	CLO-1	PLO-3	5%
5	CLO-1	PLO-3	5%
6	CLO-2	PLO-3	5%
7	CLO-1	PLO-3	5%
8	CLO-2	PLO-3	5%
9	CLO-3	PLO-3	12%
10	CLO-1	PLO-3	5%
11	CLO-2	PLO-3	5%
12	CLO-1	PLO-3	5%
13	CLO-2	PLO-3	5%
14	CLO-3	PLO-3	5%
15	CLO-2	PLO-3	5%
16	CLO-1	PLO-3	20%

- Final index is defined as follow:

Index	Converted Score	Score Range
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	<table> <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>	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	$0 \leq E < 40$
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Forms of Media	Slides, LCD projector, UNESA Learning Management System (LMS), current Vocational School mathematics curriculum documents and textbooks, Google Docs, Google Sheets, Google Slides, Desmos, GeoGebra, Microsoft Excel, smartphones, and laptops.																											
Literature	<ol style="list-style-type: none"> 1. Dooley, W. H. (1915). <i>Vocational mathematics</i>. D. C. Heath & Company. 2. Fatimah, A. T. (2022). <i>Matematika kejuruan menuju merdeka belajar</i>. Deepublish. 3. Kreyszig, E., Kreyszig, H., & Norminton, E. J. (2011). <i>Advanced engineering mathematics</i> (10th ed.). John Wiley & Sons. 4. Tussy, A. S., Gustafson, R. D., & Koenig, D. R. (2011). <i>Basic mathematics for college students</i> (4th ed.). Brooks/Cole, Cengage Learning. 																											
Note	Based on Regulation of the Minister of Higher Education, Science, and Technology of the Republic of Indonesia Number 39 of 2025 on Quality Assurance in Higher Education and the UNESA curriculum workload conversion, 1 credit unit (CU) is implemented as 170 minutes per week for 16 weeks, including midterm and final assessments. For Vocational Mathematics (2 CU), the total workload is $2 \times 170 \times 16 = 5,440$ minutes, equivalent to 90.67 hours per semester. Using the UNESA conversion of 1 CU = 1.59 ECTS, this module is equivalent to $2 \times 1.59 = 3.18$ ECTS.																											