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:	STEM Education Pendidikan STEM
Module Level:	Sarjana (S-1) / Undergraduate
Abbreviation, if applicable:	8420202004
Sub-heading, if applicable:	-
Course included in the module, if applicable:	-
Semester/term:	4 / Second year
Module Coordinator(s):	Dr. Yurizka Melia Sari, M.Pd.
Lecturer(s):	Prof. Rooselyna Ekawati, Ph.D. Dr. Endah Budi Rahaju, M.Pd. Dr. Yurizka Melia Sari, M.Pd. Dr. Ali Shodikin, S.Pd., M.Pd Dr. Lestariningsih, S.Pd., M.Pd. Nurus Saadah, S.Pd., M.Pd. Shofan Fiangga, S.Pd., M.Sc.
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/2 x 170 minutes = 340 minutes = 5.6 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 : 16x2x170 minutes = 5,440 minutes = 90.6 hours=3.18 ECTS*

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Credit Point:	2
Requirements:	N/A
Learning Goals :	PLO 5: Apply the basic principles of mathematics to solve simple mathematical problems PLO 7: Communicate ideas and research results effectively, orally, and in writing PLO 8: Make decisions based on data/information in completing tasks that are the student's responsibility and evaluating the work that has been done PLO 10: Demonstrate pedagogical knowledge in designing, implementing and evaluating mathematics learning PLO 11: Demonstrate knowledge related to mathematics education research
Content:	This course discusses the definition, fundamental concepts, and principles of STEM education as a multidisciplinary learning model. The course starts with a discussion on the history and urgency of the emergence of STEM as a relevant alternative for 21st-century learning, along with its practical classroom applications. Furthermore, the students will have the opportunity to complete STEM projects related to support the problems in the SDGs (Sustainable Development Goals) by gaining practical experience in designing and evaluating STEM-based instruction. This course will provide prospective teachers with knowledge regarding a significant, currently developing multidisciplinary learning alternative, while simultaneously fostering their scientific, technological, engineering, and mathematical literacy.
Study/exam achievements	• Students are considered competent and pass if the final score calculated from the score of midterm exam, assignments, participation, and final exam is at least 55 or C. • Final score is calculated as follows:

Week	Course Learning Outcomes (CLO)	Programme Learning Outcomes (PLO)	Evaluation
1	CLO-1	PLO-5	5%

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2	CLO-1	PLO-5	5%
3	CLO-1	PLO-5	5%
4	CLO-6	PLO-11	5%
5	CLO-4	PLO-10	5%
6	CLO-4	PLO-10	5%
7	CLO-4	PLO-10	5%
8	CLO-1	PLO-5	15%
9	CLO-2	PLO-7	5%
10	CLO-2	PLO-7	5%
11	CLO-2	PLO-7	5%
12	CLO-3	PLO-8	5%
13	CLO-4	PLO-10	5%
14	CLO-5	PLO-10	5%
15	CLO-4	PLO-10	5%
16	CLO-4	PLO-10	15%

- Final index is defined as follow:

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	1. Rodger W. Bybee. 2013. The Case for STEM Education: Challenges and Opportunities. USA: NSTA Press 2. English, L. D. (2016). STEM education K-12: Perspectives on integration. International Journal of STEM education, 3, 1-8

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	3. Kelley, T. R., & Knowles, J. G. (2016). A conceptual framework for integrated STEM education. International Journal of STEM education, 3, 1-11 4. Beatty, A. S. (2011). Successful STEM education. National Academies Press
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