Master Program of Mathematics Education **Module Handbook**

Module Name:	Mathematical Modelling
Module Level:	Master (S-2)
Abbreviation, if applicable:	
Sub-heading, if applicable:	-
Course included in the module, if applicable:	-
Semester/term:	2nd / First year
Module Coordinator(s):	Dr. Abadi, M.Sc.
Lecturer(s):	Dr. Abadi, 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 × 240 minutes = 480 minutes = 8 hours lectures
Workload:	15 weeks per semester consisting of: • 1 hour lecture (1 × 50 minutes) per week, • 2 hours assignments (2 × 45 minutes) per week, • 2 hours individual study (2 × 50 minutes) per week, Total workload: 14 × 2 × 240 minutes = 6,720 minutes ≈ 4.48 ECTS*
Credit Point:	2
Requirements:	N/A
Learning Goals :	**Knowledge (KNO-1)** CLO-1: able to understand the principles of mathematical modeling through examples of mathematical models of phenomena in everyday life in various fields. **Knowledge (KNO-2)** CLO-2: Able to demonstrate knowledge and insight related to the principles of mathematical modeling in learning mathematics. **Skill (SKI-1)**

<table>
<tr><td></td><td>CLO-3: Able to use mathematical ideas and knowledge to complete a mathematical model.

Competency (COM-1)
CLO-4: able to communicate his understanding of mathematical modeling and its application in various fields including education both in the form of written reports and orally.

Social (SOC-1)
CLO-5: Able to collaborate and be responsible professionally and ethically in completing mathematical modeling assignments.</td></tr>
<tr><td>Content:</td><td>Studying basic concepts of mathematical modeling, implementing modeling of everyday life phenomena (physics, statistics, biology, chemistry, economics, social) into mathematical models in statistics, linear programming, graph theory, differential equations, systems theory, and control. The study is continued by analyzing and completing the mathematical model obtained, evaluating and interpreting the properties of the model.</td></tr>
<tr><td>Study/exam achievements</td><td>• 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:
20% midterm exam + 30% assignments + 20% participation + 30% final exam
• Final index is defined as follows:
<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></td></tr>
<tr><td>Media employed</td><td>Slides and LCD projectors, white board</td></tr>
</table>

Reading list	[1]. Giordano F.R, Fox W.P, and Horton. S.B, 2014, A First Course in Mathematical Modeling, Fifth Edition, Brooks/Cole, Cengage Learning, Boston, MA 02210 USA. [2]. Meyer W.J, 1984, Consepts of Mathematical Modeling, Dover Publications, inc. Mineola, New York. [3]. Galbraith P. & Holton, D., 2018, Mathematical Modeling: A guidebook for teachers and teams, Australian Council for Educational Research.
Note	*Total hours per 1 credit in 1 semester = {(1 credit × 240 minutes × 14 weeks)/60 minutes} = 56 hours. Each ECTS equals 25 hours, so 1 credit in 1 semester is equivalent to 2.24 ECTS.
Last amendment	January 2023