



UNIVERSITAS INDONESIA
Faculty of Mathematics and Natural Sciences
Department of Mathematics
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MODULE HANDBOOK

Module designation	<i>Mathematical Modeling</i>
Semester(s) in which the module is taught	5
Person responsible for the module	<i>Dra. Bevina D. Handari, M.Sc., Ph.D.</i>
Language	<i>Indonesian</i>
Relation to curriculum	<i>Compulsory</i>
Teaching methods	<i>Collaborated Learning</i>
Workload (incl. contact hours, self-study hours)	<i>(Estimated) Asynchronous in EMAS 1 x 60 minutes (with teacher) + 2 x 60 minutes (between students). Contact hours: Synchronous 1 x 60 minutes, Private study including presentation preparation, specified in hours¹: 2 hours structured activities per week.</i>
Credit points	3 SKS (4.77 ECTS)
Required and recommended prerequisites for joining the module	<i>Mathematical Statistics 1, Ordinary Differential Equation, Numerical Differential Equations, Partial Differential Equations and Boundary Conditions.</i>

¹ When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

<p>Module objectives/intended learning outcomes</p>	<p><i>After completing the course, students have the following abilities:</i></p> <ol style="list-style-type: none"> 1. <i>As a group, interpreting simple real-world problems in correct mathematical language.</i> 2. <i>Determine the problem of the topic given.</i> 3. <i>Determine a model's parameters, parameters and assumptions and the solution to be used based on the explanation of real-world problems.</i> 4. <i>Adapting a mathematical model to a real-world problem.</i> 5. <i>Extracting a mathematical model using a variety of basic mathematical concepts.</i> 6. <i>Demonstrating the obtained model analytically or numerically with an easily understood implementation.</i> 7. <i>Creating a report with correct use of Bahasa Indonesia.</i>
<p>Content</p>	<ol style="list-style-type: none"> 1. <i>Introduction to mathematical modeling</i> 2. <i>Exploration of real-world problems as the first stage of mathematical modeling</i> 3. <i>Parameters and variables in mathematical modeling</i> 4. <i>Adapting mathematical models based on assumptions</i> 5. <i>Analysis of mathematical models</i>
<p>Examination forms</p>	<ol style="list-style-type: none"> 1. <i>Class activities: Small, Projects and Project</i> 2. <i>Presentations</i> 3. <i>Paper</i>

<p>Study and examination requirements</p>	<p><i>The final mark will be weighted as follows:</i></p> <ol style="list-style-type: none"> 1. <i>Small Project (10%)</i> 2. <i>Presentation I (20%)</i> 3. <i>Presentation II (25%)</i> 4. <i>Presentation III (30%)</i> 5. <i>Paper (15%)</i> <p><i>To successfully pass the module it requires minimum 55% of the total mark.</i></p> <table style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="text-align: center;"><i>Mark</i></th> <th style="text-align: center;"><i>Grade</i></th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">85—100</td> <td style="text-align: center;">A</td> </tr> <tr> <td style="text-align: center;">80—<85</td> <td style="text-align: center;">A-</td> </tr> <tr> <td style="text-align: center;">75—<80</td> <td style="text-align: center;">B+</td> </tr> <tr> <td style="text-align: center;">70—<75</td> <td style="text-align: center;">B</td> </tr> <tr> <td style="text-align: center;">65—<70</td> <td style="text-align: center;">B-</td> </tr> <tr> <td style="text-align: center;">60—<65</td> <td style="text-align: center;">C+</td> </tr> <tr> <td style="text-align: center;">55—<60</td> <td style="text-align: center;">C</td> </tr> <tr> <td style="text-align: center;">40—<55</td> <td style="text-align: center;">D</td> </tr> <tr> <td style="text-align: center;"><40</td> <td style="text-align: center;">E</td> </tr> </tbody> </table>	<i>Mark</i>	<i>Grade</i>	85—100	A	80—<85	A-	75—<80	B+	70—<75	B	65—<70	B-	60—<65	C+	55—<60	C	40—<55	D	<40	E
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<p>Reading list (resources)</p>	<ol style="list-style-type: none"> 1. <i>Michael D. Alder, An Introduction to Mathematical Modelling, HeavenForBooks.com, 2001</i> 2. <i>N. D. Fowkes, An Introduction to Mathematical Modelling, Wiley, 1994.</i> 																				