MODULE HANDBOOK

Module Name:	Mathematical Modelling
Module Level:	Sarjana (S-1) / Bachelor
Abbreviation, if applicable:	8420203007
Sub-heading, if applicable:	-
Course included in the module, if applicable:	-
Semester/term:	7/ Fourth year
Module Coordinator(s):	Dr. Yusuf Fuad, M.App. Sc
Lecturer(s):	Dian Savitri, M.Si Yuliani Puji Astuti, M.Si Dimas Avian Maulana, M.Si.
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. 3 x 170 minutes = 510 minutes = 8.5 hours lectures
Workload:	15 weeks per semester consisting of: • 2.5 hours lectures (3 x 50 minutes) per week, • 3 hours tutorial assignments (3 x 60 minutes) per week, • 3 hours individual study (3 x 60 minutes) per week, Total workload : 14x3x170 minutes = 7,140 minutes = 4.76 ECTS*
Credit Point:	3
Requirements:	Foundation of Mathematics
Learning Goals:	**Knowledge** CLO-1: Demonstrate basic knowledge and insights related to simple mathematical modeling in everyday life, mathematical modeling in physics, ecology-based mathematical modeling, and mathematical modeling economics. CLO-2: Use mathematical concepsts and ordinary differential equations to solve problems of simple mathematical modeling in everyday life, mathematical modeling in physics, ecology-based mathematical modeling, and mathematical modeling economics.

<table>
<tr><td></td><td>Skill
CLO-3: Able to implement basic principles of mathematics to solve simple mathematics problems</td></tr>
<tr><td>Content:</td><td>Understanding the mathematical modeling, formulation of the mathematical modeling in the life science, model analysis, numerical on a real problem in the field of fisic, evolution, biology, economic and industrial, and interpretation of the model.</td></tr>
<tr><td>Study/exam achievements</td><td>

This lecture materials provided with lectures, independent tasks, and discussions. To improve understanding of the material, students were given the task in the form of individual tasks and task groups. Exam in the subject of numerical methods include UTS and UAS. On this subject there is a soft skill assessment.
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 follow:

<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>
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<tr><td>Forms of Media</td><td>Slides and LCD projectors, whiteboard</td></tr>
<tr><td>Literature</td><td>

Mass, J., et.al. 2018. Mathematical Modelling for Teachers: A Practical Guide to Applicable Mathematics Education. Cham: Switzerland
Teacher College Columbia University. 2012. Mathematical Modeling Handbook. Bedford: COMAP
Fox, W. P., et. al. 2014. A First Course in Mathematical Modelling, 5th edition. Boston. Cengage Learning.
Dym, C. L., 2004. Principle of Mathematical Modelling, 2nd edition, California. Elsevier Academic Press.

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	5. Caldwell, J., Ng, Douglas K.S. 2004. *Mathematical Modelling: Case Studies and Project*. Hong Kong. Springer NetherlandsPatel, Vithal A., 1994. *Numerical Analysis.* Harcourt Brace College Publishers. Fort Worth. 6. Giardiano, F. R., Weir, M. D., and Fox, W. P., 2003, *Mathematical Modeling*, 3rd Edition, Brooks/Cole, USA. 7. Brauer, F., and Castillo-Chavez, C., 2010, *Mathematical Models in Population Biology and Epidemiology*, 2nd Edition, Springer-Verlag, New York, Inc. 8. De Vries, G.,Hillen, T., Lewis, M., Muller, J., and Schonfisch, B., 2006, A Course in mathematical Biology: Quantitative Modeling with Mathematical and Computational Methods, SIAM, Philadelphia
Note	*Total hours per 1 credit in 1 semester={(1 credit x 170 minutes x 14 weeks)/60 minutes}=39,67 hours. Each ECTS equals with 25 hours therefore 1 credit in 1 semester equals 1,59 ECTS.