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MODULE HANDBOOK

Module name	Introduction to Mathematical Models
Module level, if applicable	Bachelor
Code, if applicable	MMM-3303
Subtitle, if applicable	
Courses, if applicable	Introduction to Mathematical Models
Semester(s) in which the module is taught	5th (fifth)
Person responsible for the module	Chair of the Lab. of Applied Mathematics
Lecturers	Dr. Fajar Adi Kusumo, M.Si. and Dr. Irwan Endrayanto A., M.Sc.
Language	Bahasa Indonesia
Relation to curriculum	Bachelor Degree, Compulsory, 5th semester
Type of teaching, contact hours	150 minutes lectures and 180 minutes structured activities (homework and task) per week.
Workload	Total workload is 136 hours per semester, which consists of 150 minutes lectures per week for 14 weeks, 180 minutes structured activities per week, 180 minutes individual study per week, in total is 16 weeks per semester, including mid exam and final exam.
Credit points	3
Requirements according to the examination regulations	Students have taken Introduction to Mathematical Modeling course (MMM-3303) and have an examination card where the course is stated on.
Recommended prerequisites	Students have taken Introduction to Partial Differential Equations course (MMM-2310), Introduction to Probability Model course (MMM-2410), and have participated in the final examination of the course. Before taking this course, students must have a good understanding about the concepts of differential equations (ODE and PDE), and some basic concepts on Probability Model.
Module objectives/intended learning outcomes	After completing this course the students will have : CO1. ability to formulate the mathematical model due to the problems. CO2. ability to connect the simple real problem with the concepts on Mathematics. CO3. ability to interpret the mathematical result on a model to the original problems. CO4. ability to formulate some complex problems, e.g. physics problems, medical problems, biological problems, etc which are to be modeled. CO5. ability to interpret the results of the modeling analysis due to other disciplines.
Content	Topics : a. Motivation of Mathematical Modeling b. Basic concept of Mathematical Modeling c. Some simple mathematical models and their analysis. d. Mathematical modeling based on the system of the differential equations e. Mathematical modeling based on the probability and optimization.
Study and examination requirements and forms of examination	The final mark will be weighted as follows: No — Assessment methods (components, activities) — Weight (percentage) 1 — Final Examination — 35 2 — Mid-Term Examination — 25 3 — Presentation — 20 4 — Class Activities: Quiz, Homework, etc — 20

	The initial cut- off points for grades A, B, C, and D should not be less than 80%, 70%, 50%, and 40%, respectively.
Media employed	White/Black Board, LCD Projector, Laptop/Computer
Reading List	1. B. Barnes, dan G.R. Fulford, 2002, "*Mathematical Modeling with Case Studies: A differential equation approach using mapple*", Taylor & Francis, Inc, London. 2. F.R. Giordano, M.D. Weir, dan W.P. Fox, 1977, "*A First Course in Mathematical Modeling*", Thomson Books/Cole, Australia. 3. Richard Haberman, 2003, *"Mathematical Models: Mechanical Vibrations, Population Dynamics, and Traffic Flow"*, Prentice Hall Inc, Englewood Cliffs, New Jersey. 4. D.P. Maki, dan M. Thompson, 1973, "*Mathematical Models and Applications with Emphasis on The Social Life, and Management Sciences*", Prentice Hall Inc, Englewood Cliffs, New Jersey. 5. Masatoshi Sakawa, 1993, "Fuzzy Sets and Interactive Multi Objective Optimization", Plenum Press, New York.

PLO and CO Mapping

	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7	LO 8	LO 9
CO 1		√	√		√	√			√
CO 2		√	√		√	√	√		√
CO 3		√	√		√	√	√		√
CO 4		√	√		√	√	√		√
CO 5			√		√	√	√		