UNIVERSITAS GADJAH MADA
Faculty of Mathematics and Natural Sciences
Department of Mathematics
Sekip Utara Bulaksumur Yogyakarta 55281 Telp: +62 274 552243 Fax: +62 274 555131 Email: math@ugm.ac.id Website: http://math.fmipa.ugm.ac.id

Master in Mathematics

Telp : +62 274 552243
Email : maths2@ugm.ac.id; kaprodi-s2-matematika.mipa@ugm.ac.id
sekprodi-s2-matematika.mipa@ugm.ac.id
Website : http://s2math.fmipa.ugm.ac.id/

MODULE HANDBOOK

Module Name	*Mathematical Modelling and Computation*
Module level, if applicable	*Master Program*
Code, if applicable	*MMM-5317*
Subtitle, if applicable	
Courses, if applicable	*Mathematical Modelling and Computation*
Semester(s) in which the module is taught	*II (second year)*
Person responsible for the module	*Chair of the Lab. of Applied Mathematics*
Lecturer(s)	*Dr. Fajar Adi Kusumo and Dr. Nanang Susyanto*
Language	*Bahasa Indonesia*
Relation to curriculum	*~~Compulsory~~ / **Elective** / ~~Specialisation~~* *Names of other study programmes with which the module is shared: -*
Teaching methods	*lecture, lesson, project.*
Workload (incl. contact hours, self-study hours)	*(Estimated) Total workload:* - *136 hours per semester* *Contact hours (please specify whether lecture, exercise, laboratory session, etc.):* - *150 minutes (2.5 hours) lectures per week for 14 weeks, 180 minutes (3 hours) structured activities per week, in total is 16 weeks per semester, including mid exam and final exam.* *Private study including examination preparation, specified in hours:* - *180 minutes (3 hours) individual study per week*
Credit points	*3*

Required and recommended prerequisites for joining the module	*Before taking this course, the students must have a good understanding about the concept of the Differential Equations and some basic concept of Probability Theory and Stochastic Process.*
Module objectives/intended learning outcomes	*After completing this course, the students should have:* *CO 1. Ability to classify the mathematical model due to the problems* *CO 2. Ability to create a deterministic model to connect a simple real problem with the concepts on Mathematics and give the solutions of the problem in mathematical point of view* *CO 3. Ability to create a probabilistic model to connect a simple real problem with the concepts on Mathematics and give the solutions of the problem in mathematical point of view* *CO 4. Ability to interpret the mathematical results of a model to the original problems.*
Content	*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 with computations* *e. Mathematical modelling based on the probability theory with computations.*
Examination forms	*Oral presentation, Essay, Presentation*
Study and examination requirements	*To pass the course, students are expected to get a minimum grade of D. The final mark will be weighted as follows:* *No Assessment methods* — *Weight (percentage)* *1. Final Examination* — *30 (15% case based)* *2. Mid-Term Examination* — *30 (10% case based)* *3. Project and Presentation* — *25 (25% case based)* *4. Other Activities: Quiz, Homework, etc.* — *15* (10% case based)
Media employed	*Boards, projectors, Laptop/Computer*
Reading list	1. *Haberman, R., 2003, Mathematical Models: Mechanical Vibrations, Population Dynamics, and Traffic Flow, Prentice Hall Inc, Englewood Cliffs, New Jersey.* 2. *Bishop, 2006, Pattern Recognition and Machine Learning, Springer.* 3. *Altiok, T., Melamed B., 2007, Simulation Modeling and Analysis with ARENA, Academic Press.* 4. *Kulkarni, V. G., 2011, Introduction to modeling and analysis of stochastic systems, Springer New York.* 5. *Shier, D. R., Wallenius, K. T., 1999, Applied Mathematical Modeling A Multidisciplinary Approach, Chapman and Hall/CRC.*

CO-PLO Mapping

	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6
CO 1	√	√	√			
CO 2		√	√	√		
CO 3			√		√	
CO 4	√				√	√

Last Modified Date : 1 August 2022