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Doctor in Mathematics

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MODULE HANDBOOK

Module Name	*Mathematical Modelling and Computation*
Module level, if applicable	*Doctoral Program*
Code, if applicable	*MMM-7318*
Subtitle, if applicable	
Courses, if applicable	*Topics in Mathematical Modeling*
Semester(s) in which the module is taught	*1st or 2nd (first or second semester)*
Person responsible for the module	*Chair of the Lab. of Applied Mathematics*
Lecturer(s)	*Lecturer appointed by the Lab. of Applied Mathematics*
Language	*Bahasa Indonesia*
Relation to curriculum	~~*Compulsory*~~ / ***Elective*** / ~~*Specialisation*~~ *Names of other study programmes with which the module is shared: -*
Teaching methods	*lecture, discussion, presentation*
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 of fundamental concepts in mathematics related to the research topic.*
Module objectives/intended learning outcomes	*After completing this course, the students should have ability to:* *CO 1. classify the mathematical model related to the research topic.* *CO 2. combine theories in mathematics and related disciplines to understand and solve a simple problem related to the research being carried out.* *CO 3. interpret the mathematical results to the real problems related to the research being carried out.*
Content	***Deterministic models:*** *discrete, exponential, and logistic population growth models, spring and pendulum oscillations, compartmental models, model fitting, interpretation.* ***Probabilistic models:*** *Review on probability theory and statistics (random variables, density functions, estimation), some examples in probabilistic models, parameter estimation, model fitting, interpretation* ***Stochastic models:*** *Review on stochastic processes (random variables, Markov chain, simulation), some examples in stochastic models, simulation, interpretation*
Examination forms	*Presentation, Written Report*
Study and examination requirements	*To pass the course, students are expected to get a minimum grade of B. The final mark will be weighted as follows:* *No Assessment methods — Weight (percentage)* *1. Project: Discussion and presentation — 60* *2. Project: Written Report — 40*
Media employed	*Boards, projectors, Laptop/Computer*
Reading list	1. *Haberman, R., 1977, Mathematical Models: Mechanical Vibrations, Population Dynamics and Traffic Flow. Prentice-Hall, Inc., Englewood Cliffs.* 2. *Illner, R., Bohun, C.S., McCollum, S., and van Roode, T., 2005, Mathematical modeling: a case studies approach, American Mathematical Society*

CO-PLO Mapping

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

Last Modified Date : 10 August 2022