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Master in Mathematics

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MODULE HANDBOOK

Module Name	*Differential Equation*
Module level, if applicable	Master
Code, if applicable	MMM 5303
Subtitle, if applicable	
Courses, if applicable	Differential Equations
Semester(s) in which the module is taught	2nd (second)
Person responsible for the module	Chair of the Applied Mathematics Research Group
Lecturer(s)	Prof. Dr. Ch. Rini Indrati, M.Si. and Dr.rer.nat. Lina Aryati, M.S.
Language	Bahasa Indonesia
Relation to curriculum	Master Degree, Compulsory for Applied Mathematics and Computation interest, 2nd semester
Teaching methods	*Lecture, Discussion, Flipped Classroom, and Presentation.*
Workload (incl. contact hours, self-study hours)	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*
Required and recommended prerequisites for joining the module	Students have knowledge of the concept of differential equations.

Module objectives/intended learning outcomes	After completing this course, the students have the ability to: CO 1. prove the fundamental theorem of a differential equation. CO 2. justify and evaluate the existence and uniqueness of solutions of initial value problems for ordinary differential and systems of differential equations. CO 3. justify the characteristic of autonomous systems' equilibrium/critical points. CO 4. justify and evaluate traveling wave solutions. CO 5. justify and evaluate the stability of the equilibrium/critical points of partial differential equations.
Content	Fundamental theorems of differential equations, existence and uniqueness of solution of ordinary differential equations and systems of differential equations with initial conditions, extension of solution, approximation solutions, stability and characteristics of equilibrium/critical points, linearization method, traveling wave solutions, and stability of the equilibrium/critical points of partial differential equations.
Examination forms	*Oral presentation and essay*
Study and examination requirements	To pass the course, the minimum grade is C. The final mark will be weighted as follows: No — Assessment methods (components, activities) — Weight (percentage) 1 — Final Examination — 30% 2 — Mid-Term Examination — 30% 3 — Class Activities: Presentation and Quiz — 20% 4. — Homework — 20%
Media employed	*Whiteboard, LCD, computer, and wifi. Platform: Zoom or google.meet*
Reading list	1. Hurewicz W., 1958, Lectures on Ordinary Differential Equations, Massachusetts Institute of Technology, USA. 2. Ross S.L., 1984, Differential Equations, John Wiley and Sons, New York. 3. Perko L., 2000, *Differential Equations and Dynamical Systems,* 3rd Edition, Springer-Verlag, New York. 4. Logan J. D., 2008*, An Introduction to Nonlinear Partial Differential Equations,* John Wiley and Sons, New Jersey. 5. Drazin. P. G. And Johnson, R S, 1989, *Soliton: an Introduction*, Cambridge University Press, New York.

CO-PLO Mapping

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

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