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MODULE HANDBOOK

Module name	Introduction to Theory of Differential Equations
Module level, if applicable	Bachelor
Code, if applicable	MMM-3103
Subtitle, if applicable	-
Courses, if applicable	Introduction to Theory of Differential Equations
Semester(s) in which the module is taught	6th (sixth)
Person responsible for the module	Chair of the Lab. of Analysis
Lecture(s)	Prof. Dr. Ch. Rini Indrati, M.Si.
Language	Bahasa Indonesia
Relation to curriculum	Bachelor Degree, Elective Course, 6th semester
Type of teaching, contact hours	150 minutes lectures and 180 minutes structured activities 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 Theory of Differential Equations course (MMM-3103) and have an examination card where the course is stated on.
Recommended prerequisites	Competencies in Elementary Differential Equations, Introduction to Analysis I, and sequence of functions.
Module objectives/intended learning outcomes	After completing this course the students have ability to : CO 1. prove some conditions in Picard Theorem. CO 2. analyze the existence and uniqueness of the solution of initial value problem and give an approximation solution of the initial value problem. CO 3. analyze the existence and uniqueness of the solution of linear system of differential equations with initial conditions. CO 4. characterize the critical/equilibrium point of linear system of differential equations and prove the stability of the critical/equilibrium point. CO 5. perform Sturm-Liouville theorem to analyze: i. the relation between two solutions of second order linear differential equations. ii. the zeros of two solutions of second order linear differential equations.
Content	a. Differential equation of order one: approximation solution, existence and uniqueness of the solution of intial value problem, stability of the solution. b. System of differential equations of order one: existence and uniqueness of the solution, critical points, stability of a solution c. Sturm-Liouville's Theorem: Sturm-Liouville's theorem and its applications.
Study and examination requirements and forms of	The final mark will be weighted as follows: No Assessment methods (components, activities) Weight (percentage)

examination	1 Final Examination 45% 2 Mid-Term Examination 30% 3 Class Activities: Quiz, Homework, etc. 25% 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	Board, LCD Projector, Laptop/Computer
Reading List	1. Shepley L. Ross, 1984, *Differential Equations*, third edition, John Wiley & Sons. 2. John L. Troutman, and Maurino Bautista, 1994, *Boundary Value Problems of Applied Mathematics*, PWS Publ. Co., Boston. 3. George F. Simmons, and John S. Robertson, 1991, *Differential Equations with Applications and Historical Notes*, Second edition, McGraw-Hill, New York. 4. George F. Simmons and Steven G. Krantz, 2007, *Differential Equations: Theory, Technique, and Practice*, McGraw-Hill International Edition, New York. 5. Ch. Rini Indrati dan Lina Aryati, 2017, *Pengantar Teori Persamaan Diferensial*, 2017, Linta Pustaka Utama, Yogyakarta.

PLO and CO Mapping

	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8	PLO 9
CO 1			v			v			v
CO 2			v			v	v		v
CO 3			v		v	v	v		v
CO 4			v		v		v		v
CO 5			v			v	v		v