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MODULE HANDBOOK

Module name	Multivariable Calculus I
Module level, if applicable	Bachelor
Code, if applicable	MMM-2109
Subtitle, if applicable	-
Courses, if applicable	Multivariable Calculus I
Semester(s) in which the module is taught	3th (third)
Person responsible for the module	Chair of the Lab. of Analysis
Lecturer(s)	Prof. Dr. Ch. Rini Indrati, M.Si. Atok Zulijanto, S.Si., M.Si., Ph.D.
Language	Bahasa Indonesia
Relation to curriculum	Compulsary course in the second year (3rd semester) Bachelor Degree
Type of teaching, contact hours	100 minutes lectures and 120 minutes structured activities per week.
Workload	Total workload is 90.67 hours per semester, which consists of 100 minutes lectures per week for 14 weeks, 120 minutes structured activities per week, 120 minutes individual study per week, in total is 16 weeks per semester, including mid exam and final exam.
Credit points	2
Requirements according to the examination regulations	Students have taken Multivariable Calculus I course (MMM-2109) and have an examination card where the course is stated on.
Recommended prerequisites	Students have taken the module of Calculus II (MMM-1102) and Analytical Geometry (MMM-1106) and have participated in the final exam of the module.
Module objectives/intended learning outcomes	After completing this course, the students should have: CO 1. ability to generalize the fundamental concepts of multivariable calculus such as limit, partial derivative, differentiable, double and triple integrals. CO 2. ability to solve problems on limit and derivative of functions of several, double integrals, and triple integrals. CO 3. ability to apply the concepts of multivaribles calculus effectively to solve problems in mathematics such as optimization problems, Taylor series, and volume of a solid.
Content	- Topology of $\mathbb{R}^n$: distance, neighborhod, interior points, boundary points, limit points, open sets, close sets, region. - Function of several variables and its graph. - Limit and continuity of functions of several variables. - Partial derivatives and its geometric interpretations, higher partial derivatives, differentiable, differential, partial derivatives of composite functions and implicit functions, Taylor series of multivariable functions, maximum and minimum problems with and without constraint. - Multiple integrals and its applications: double integrals in cartesian and polar coordinates, triple integrals in cartesian, cylindrical, and spherical coordinates, double and triple integrals with transformation, volume of solids.

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 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. Kenneth R. Davidson, Allan P. Donsig, 2002, *Real Analysis with Real Applications*, Prentice Hall. 2. Leonard I. Holder, James DeFranza, and Jay M. Pasachoff, 1994, *Multivariable Calculus, 2nd Edition*, Brroks/Cole Publishing Company, USA. 3. Angus E. Taylor, 1989, *Advanced Calculus*, Blaisdell. 4. Charles Dixon, 1981, *Advanced Calculus*, John Wiley.

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		V
CO 2		V					V		V
CO 3		V			V		V		V