

**BACHELOR OF INFORMATICS PROGRAM**  
**DEPARTMENT OF INFORMATICS**  
**FACULTY OF INTELLIGENT ELECTRICAL AND INFORMATICS TECHNOLOGY**  
**INSTITUT TEKNOLOGI SEPULUH NOPEMBER**

Module name	<b>Multivariate Data Analysis</b>
Module level	Undergraduate
Code	IF184922
Courses (if applicable)	<b>Multivariate Data Analysis</b>
Semester	<b>6</b>
Contact person	...
Lecturer	...
Language	Bahasa Indonesia and English
Relation to curriculum	1. Undergraduate degree program; elective; 6 <sup>th</sup> , 7 <sup>th</sup> , or 8 <sup>th</sup> semester. 2. International undergraduate program; elective; 6 <sup>th</sup> , 7 <sup>th</sup> , or 8 <sup>th</sup> semester.
Type of teaching, contact hours	1. Undergraduate degree program: lectures, < 60 students, 2. International undergraduate program: lectures, < 40 students
Workload	1. Lectures: 3 x 50 = 150 minutes (2 hours 30 minutes) per week. 2. Exercises and Assignments: 3 x 60 = 180 minutes (3 hours) per week. 3. Private study: 3 x 60 = 180 minutes (3 hours) per week.
Credit points	3 credit points (sks).
Requirements according to the examination	A student must have attended at least 80% of the lectures to sit in the exams.

regulations	
Mandatory prerequisites	Probability and Statistics
	After completing this module, a student is expected to:

Learning outcomes and their corresponding PLOs	Students can explain the differences in univariate and multivariate analysis.	
	Students can use a variety of appropriate multivariate modeling analysis purposes.	
	Students can analyze the results of the multivariate data processing.	
	Students can use multivariate statistical data processing software.	

Content	<p>Knowledge:</p> <ul style="list-style-type: none"> <li>• Mastering concept and principles of Intelligent System such as representation and reasoning techniques, searching technique, intelligent agent, data mining, machine learning, and development of intelligent application in various fields, and also mastering concept and principles of computation science such as manage information, multimedia data processing, and numerical analysis</li> <li>• Mastering the concepts and principles of computer graphics including modeling, rendering, animation, and visualization, and also mastering the concepts and principles of human computer interaction</li> <li>• Mastering principles and methods to solve computation problems by using calculus, matrixs, statistics, approximation, linear optimization, modelling and simulation</li> </ul> <p>Specific Skill:</p> <ul style="list-style-type: none"> <li>• Able to desain and develop applications using principles of intelligent systems and computing science to produce intelligent applications in various fields</li> <li>• Able to develop application using computer graphics principles including modeling, rendering, animation, and visualization, implement human computer interaction principles, and evaluate the efficiency of the appropriate interface in the application developed.</li> <li>• Able to solve computation problems, and mathematical modelling through exact, stochastic, probablistic, and numeric approaches effectively and efficiently</li> </ul>
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Study and examination requirements and forms of examination	Mid-terms examination and Final examination.
Media employed	LCD, whiteboard, websites, books (as references), etc.
Assessments and Evaluation	CO1: Problem 1 in mid-term exam (5%) and exercise 1 (5%) - 10% CO2: Problem 2 in mid-term exam (5%) and exercise 2 (5%) - 10% CO3: Problem 3 in mid-term exam (5%); problem 4 in mid-term exam (5%); assignment 1: make an algorithm and computer program (5%); and exercise 3 (5%) - 20% CO4: Problem 5 in mid-term exam (5%); problem 1 in final exam (5%) and exercise 4 (5%) - 15% CO5: Problem 2 in final exam (5%); assignment 2: make a function and recursive (5%); and exercise 5 (5%) - 15% CO6: Problem 3 in final exam (5%) and exercise 6 (5%) - 10% CO7: Problem 4 in final exam (5%) and exercise 7 (5%) - 10% CO8: Problem 5 in final exam (5%) and assignment 3: make a program based on a real-life problem (5%) - 10%
Reading List	Barbara G. Tabachnick, Linda S. Fidell, "Using Multivariate Statistics", 5th Edition, Pearson International Edition, 2007.  Joseph F. Hair, Jr., William C. Black, dkk "Multivariate Data Analysis", 7th Edition, Pearson International Edition, 2010.  Richard A. Johnson, Dean W. Wichern, "Applied Multivariate Statistical Analysis", Prentice Hall International Inc., 2007.