

# HANDBOOK

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

Module name	<b>Probability and Statistics</b>	
Module level	Undergraduate	
Code	IF184405	
Courses (if applicable)	<b>Probability and Statistics</b>	
Semester	Even	
Contact person	Dr. Ahmad Saikhu, S,Si, MT	
Lecturer	Victor Hariadi, S.Si, M.Kom Dr. Ahmad Saikhu, S,Si, MT.	
Language	Bahasa Indonesia and English	
Relation to curriculum	<ol style="list-style-type: none"> <li>Undergraduate degree program; mandatory; 4<sup>th</sup>, 6<sup>th</sup>, or 8<sup>th</sup> semester.</li> <li>International undergraduate program; mandatory; 4<sup>th</sup>, 6<sup>th</sup>, or 8<sup>th</sup> semester.</li> </ol>	
Type of teaching, contact hours	<ol style="list-style-type: none"> <li>Undergraduate degree program: lectures, &lt; 60 students,</li> <li>International undergraduate program: lectures, &lt; 40 students</li> </ol>	
Workload	<ol style="list-style-type: none"> <li>Lectures: 3 x 50 = 150 minutes (2 hours 30 minutes) per week.</li> <li>Exercises and Assignments: 3 x 60 = 180 minutes (3 hours) per week.</li> <li>Private study: 3 x 60 = 180 minutes (3 hours) per week.</li> </ol>	
Credit points	3 credit points (sks).	
Requirements according to the examination regulations	A student must have attended at least 80% of the lectures to sit in the exams.	
Mandatory prerequisites	Discrete Mathematics	
	After completing this module, a student is expected to:	

Learning outcomes and their corresponding PLOs	<b>CO1</b> Students can explain about fundamentals of Statistics in relation to the data analysis. Students can make a model of the probability of an event of a random experiment..	PLO3
	<b>CO2</b> Students can model the random experiment with Bayesian theorem approach. Students can model the random experiment using random variable approach.	PLO3
	<b>CO3</b> Students can calculate the probability of discrete and continuous random variables with a variety of special distributions. Students can explain the concept of expectation, variance, covariance and correlation.	PLO3
	<b>CO4</b> Students can explain the concept of probability distributions approach and Chebyshev theorem. Students have an ability to estimate parameter using samples.	PLO3
	<b>CO5</b> Students can calculate the estimators of the population parameters and make a conclusions. Students can perform a hypothesis test of the population parameters and make a conclusions.	PLO4
	<b>CO6</b> Students can create an ANOVA model. Students can apply the orthogonal experimental design to analyze the influence of multiple factors.	PLO4
	<b>CO7</b> Students can create a model of PCA to reduce the dimension of data.	PLO4
	<b>CO8</b> Students are able to apply Probability and Statistics in some cases	PLO5
Content	<p>Knowledge:</p> <p>Mastering principles and methods to solve computation problems by using calculus, matrix, statistics, approximation, linear optimization, modelling and simulation.</p> <p>Mastering principles of algorithm development and various programming language concepts</p> <p>Specific Skill:</p> <p>Able to solve computation problems, and mathematical modelling through exact, stochastic, probabilistic, and numeric approaches effectively and efficiently</p> <p>Capable of desaining and analizing of algorithms to solve problems effectively and efficiently based on programming principles, and able to apply programming model in various programming language; and able to choose programming languages in producing appropriate applications</p>	
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	Ronald E.Walpole, Raymond H.Myers, "Probability & Statistics for Engineers & Scientists", 9th Edition, Prentice-Hall Inc., 2010.  Michael Baron, "Probability & Statistics for Computer Scientists", Chapman & Hall, 2007.  Sheldon Ross, "A First Course in Probability", Prentice Hall, 9th Edition, 2012.