INSTITUT TEKNOLOGI SEPULUH NOPEMBER
FACULTY OF SCIENCE AND DATA ANALYTICS
DEPARTMENT OF STATISTICS
STATISTICS UNDERGRADUATE PROGRAM

Course	Course Name	:	**Introduction to Probability Theory**
	Course Code	:	SS234207
	Credit	:	4 SKS
	Semester	:	II

COURSE DESCRIPTION

Probability Theory is one of the basic courses that is part of the field of study in statistical theory. The purpose of studying the Probability Theory is to master the concepts of Random Experiments, Random Variables, Probability Spaces, Distribution Functions, Conditional Distributions and Stochastic Freedom, Mathematical Expectations, Moment Generation Functions, Characteristic Functions, distributions of discrete random variable functions, distributions of continuous random variable functions, as well as applications in statistical methods so that students will have a learning experience to think kristically and be able to give decisions which is appropriate about the use of the concept. The learning strategies used are discussions and exercises and tasks.

PROGRAM LEARNING OUTCOME

PLO-4	Able to apply science and mathematics to support the understanding of statistical methods.
PLO-5	Able to apply statistical theory to statistical methods.

COURSE LEARNING OUTCOME

CLO.1	Mastering the concepts of random experiments, random variables, probability spaces, distribution functions, conditional distributions and stochastic freedom, mathematical expectations, moment generation functions, characteristic functions, distributions of discrete random variable functions, distributions of random variable functions continuous,
CLO.2	Can formulate problems of random experiments, random variables, probability spaces, distribution functions, conditional distributions and stochastic freedoms, mathematical expectations, moment-generating functions, characteristic functions, distributions of discrete random variable functions, distributions of continuous random variable functions
CLO.3	Can choose the method of determining the k-th moment, the distribution of the discrete random variable function, the distribution of the kontinu random variable function, and be able to adapt to probability problems, probability models
CLO.4	Can formulate problems of random experiments, random variables, probability spaces, distribution functions, conditional distributions and stochastic freedom,

mathematical expectations, moment-generating functions, characteristic functions, distributions of discrete random variable functions, distributions of continuous random variable function

MAIN SUBJECT

1. Sets, Random experiments, sample rooms and Events. Field and σField
2. Probability : Set function, Definition of axiomatic probability and probability theorem, Conditional probability Nature of independence Total probability and Bayes Theorem
3. Random variables: discrete random variables, continuous random variables
4. Probability space, Conditional probability, Bayes Theorem and stochastic freedom
5. Discrete distribution of random variables and their properties
6. Distribution of continuous random variables and their properties
7. Expectations , moments and variances of discrete and continuous random variables and their properties
8. Convergence in probability, Convergence almost surely, Convergence in distribution and CLT
9. Distribution of discrete random variable functions
10. Distribution of continuous random variable functions

PREREQUISITE

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REFERENCES

1. Hogg, R.V. dan Craig, A.T. 1995. Introduction to Mathematical Statistics, 5th ed.Mac Millon. New York.
2. Mood, A.M., Graybill,F.A. dan Boes, D.C. 1974. Introduction of the Theory of Statistics. 4th ed. Mc-Graw Hill. Tokyo.
3. Rohatgi, W.K., 1976., An Introduction to Probability Theory and Mathematical Statistics, John Wiley and Sons, New York.
4. Salas SL, Hille e,(1982)., "Calculus of One and Several Variables", 4th ed, Jhon Wiley, New York.,
5. Bartoszynski, R. and Bugaj, M.N.,, 1996, Probability and Statistical Inference, John Wiley & Sons, New York.
6. Bhat, B.R., 1981, Modern Probability Theory, John Wiley & Sons, New York