



SYLLABUS

Faculty	: Mathematics and Natural Sciences
Study Program	: Mathematics Education
Course & Code	: Probability Theory, MAA 317
Credit Hours	: Theory 2 credit, Practice 1 credit
Semester	: IV
Prerequisites & Code	: Elementary Statistics, MAA 306
Lecture	: Kismiantini, M.Si.

I. COURSE DESCRIPTION

The course is more focused on probability concepts than statistical mathematics. The materials of probability theory are combinatorial methods, probability, random variables and their distributions, joint distributions, properties of random variables, and functions of random variables.

II. BASIC COMPETENCY

The students able to use probability and probability distribution for solving a real problem and mathematics problem which is need the calculation of probability, prove the theorems which related to probability, and find a relationship between distributions, and determine expected value of random variables.

III. ACTIVITIES PLAN

Meeting	Based Competency	Subject Matter	Activities	References
1-2	To understand the counting and combinatorial methods	Combinatorial Methods: the basic principle of counting, permutation, combination	Discussion & Exercises	A: 31-39 B: 1-16
3-5	To understand the axiomatic approach to probability, some properties of probability, conditional probability and Bayes theorem	Probability: definition of probability, some properties of probability, conditional probability, Bayes theorem	Discussion & Exercises	A: 1-30 B: 25-54
6-10	To understand random variables and their properties,	Random Variables and Their Distributions: discrete random variables and continuous	Discussion & Exercises	A: 53-83

	expectation, variance and moment generating functions	random variables		
11		Test I		
12-16	To recognize and learn the special probability distributions and their properties distributions	Special Probability Distributions: special discrete distributions and special continuous distributions	Discussion & Exercises	A: 91-124 B: 126-232
17-21	To solve a probability problem with reference to joint distributions	Joint Distributions: joint discrete distributions, joint continuous distributions, independent random variables, and conditional distributions	Discussion & Exercises	A: 137-160 B: 244-293
22		Test II		
23-26	To explain some properties of random variables such as expected values, covariance, correlation, conditional expectation, and joint moment generating functions	Properties of Random Variables: properties of expected values, covariance, correlation, conditional expectation, joint moment generating functions	Discussion & Exercises	A: 171-188 B: 309-372
27-31	To gain the ability to use some properties of random variables and their distribution in functions of random variables	Functions of Random Variables: the cumulative density function technique, transformation methods, joint transformations, sums of random variables, moment generating function method	Discussion & Exercises	A: 193-214
32		Final Test		

IV. REFERENCES

A. Compulsory textbooks :

Bain, Lee J. & Engelhardt, Max. 1992. *Introduction to Probability and Mathematical Statistics*. Belmont: Duxbury Press.

B. Suggested reference books :

Ross, Sheldon M. 1998. *A First Course in Probability*. New Jersey: Prentice-Hall.

V. EVALUATION

No.	Components	Weight (%)
1.	Participations	10%
2.	Assignment	15%
3.	Quiz	15%
4.	Test I	20%
5.	Test II	20%
6.	Final Test	20%
Total		100%