

## Rancangan Percobaan

<b>Course Brief Description:</b>	This course discusses various types of experimental designs that can be applied in agricultural engineering research. Topics that will be covered include introduction to experimental design concepts, design of experiment using completely randomized design, randomized block design, Latin Square design, factorial experiments and split-plot designs, and data analysis using analysis of variance, Least Significance Different, honestly significance difference and Tukey's w-procedure.
<b>Course Learning Objectives:</b>	<p>[1] Students will be able to formulate an experimental design related agricultural engineering problems.</p> <p>[2] Students will be able to apply quantitative methods for effective decisions-making.</p>
<b>Related Expected Learning Outcomes (ELOs):</b>	<ul style="list-style-type: none"> <li>• ELO-3: Apply knowledge of mathematics, sciences, and engineering principles in agricultural fields.</li> <li>• ELO-4: Use quantitative analysis, information technology and critical thinking in agricultural engineering profession.</li> <li>• ELO-10: Explore and develop effective solutions related to agricultural engineering issues.</li> </ul>
<b>Teaching Method</b>	<ul style="list-style-type: none"> <li>• Lecture and in-depth discussion</li> <li>• Tutorial</li> <li>• Independent assignment</li> </ul>
<b>Grading Policy</b>	<ul style="list-style-type: none"> <li>• Quiz and Assignment : 20%</li> <li>• Exam : 80%</li> </ul>
<b>Reference</b>	<p>Gomez, K. A. dan A.A. Gomez. 1995. Prosedur Statistik untuk Penelitian Pertanian (Statistical Procedures for Agricultural Research) edisi kedua. Penerbit Universitas Indonesia (UI Press). Jakarta.</p> <p>Steel, R. G. D. dan J. H. Torrie. 1993. Prinsip dan Prosedur Statistika: Suatu Pendekatan Biometrik (Principles and Procedures of Statistics) cetakan ketiga. PT. Gramedia Pustaka Utama, Jakarta.</p>
<b>Lecturer Name</b>	<ul style="list-style-type: none"> <li>• Dr. Ir. Supratomo, DEA</li> <li>• Prof. Dr. Ir. Mursalim</li> </ul>

### Course Outline

Lecture:	Topic:
I	INTRODUCTION
	What is an experiment ?
	Objectives of an experiment
	Experimental unit and treatment
	Experimental error
	Replication and its functions
	Factors affecting the number of replicates

II - IV	THE COMPLETELY RANDOM DESIGN
	Introduction
	Assumptions underlying the analysis of variance
	Linear models and the analysis of variance
	Data with a single criterion of classification. Equal replication
	Data with a single criterion of classification. Unequal replication
	The least significant difference
	The honestly significance difference
V - VII	Tukey's w-procedure
	THE RANDOMIZED COMPLETE-BLOCK DESIGN
	Introduction
	Linear models and the analysis of variance
VIII	Randomized complete block design
	Randomized complete-block design: more than one observation per experimental unit
IX - X	MID TEST
XI - XIII	LATIN SQUARES
	Analysis of variance of the Latin square
	Estimation of gain in efficiency
	The linear model for the Latin square
XIV - XV	The size of an experiment
	FACTORIAL EXPERIMENTS
	Introduction
	Linear models for factorial experiments
FINAL TEST	The 2 X 2 factorial experiment, an example
	The 3 X 3 X 2 or 3 <sup>2</sup> X 2 factorial, an example
	SPLIT-PLOT DESIGNS
	Introduction
	The split-plot model
	An example of a split plot