



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

Course	Course Name	: <b>Introduction to Meta Analysis</b>
	Course Code	: SS234757
	Credit	: 3 SKS
	Semester	: VII

**COURSE DESCRIPTION**

Meta Analysis is one of the expertise courses that is part of the field of study in the Environmental and Health Statistics course family. The purpose of studying Meta Analysis is that students are able to understand the basic concepts and statistical methods for meta analysis, as well as strategies for interpreting the results of meta analysis on a real problem, both in its development and application. Through this course, it is hoped that students will have the learning experience to think critically and be able to give the right decisions about the appropriate meta-analysis method on a problem and its solution. The learning strategies used are discussions and exercises and tasks.

**PROGRAM LEARNING OUTCOME**

- PLO-6 Able to design, collect, and perform data management with the right methodology
- PLO-7 Able to use modern computing devices to solve statistical problems
- PLO-10 Able to apply business, industrial, economic, social, health or environmental statistical methods to real problems

**COURSE LEARNING OUTCOME**

- CLO.1 Able to apply knowledge of statistical, mathematical, and computational theories related to the concept of meta analysis
- CLO.3 Able to analyze data with appropriate statistical methods and interpret them
- CLO.4 Able to identify, formulate, and solve statistical problems in various applied fields

**MAIN SUBJECT**

1. Application of meta analysis in real problems. Univariate data and multivariate data.
2. The concept of Effect Size, Precision Measure and heterogeneity measures in meta analysis
3. test statistics on the hypothesis of averaging one population. Size of the effect and interpretation on the hypothesis of the average of one population.
4. precision measures and interpretation on the hypothesis of averaging one population.
5. Heterogeneity measures and interpretation on the hypothesis of averaging one population.
6. the statistics of the test, size and interpretation on the hypothesis of an average of two populations.
7. Heterogeneity Measure and interpretation on the Hypothesis of the Mean of Two Populations.
8. estimates, test statistics, Effect Size and Precision, Size of Heterogeneity and interpretation on fixed effect models.
9. estimates, test statistics, effect size and precision, heterogeneity and interpretation on

random models of effects and mixtures.

10. estimates, test statistics, effect size and precision, heterogeneity and interpretation in linear regression models.
11. estimates, test statistics, effect size and precision, heterogeneity and interpretation in logistic regression models.
12. publication bias and interpretation on a meta model.
13. Power Analysis, Power Tests and interpretation on a Meta Model.

#### PREREQUISITE

Regression Analysis, Categorical Data Analysis

#### REFERENCES

1. Borenstein M, Hedenganes LV, Higgins JPT, and Rothstein HR, 2009. Introduction to Meta-Analysis. John Wiley dan Sons, Ltd.
2. Bohning, D., Sasivimol, R., and Ronny, K. 2008. Meta Analysis of Binary Data Using Profile Likelihood. Chapman dan Hall/CRC Taylor dan Francis Group.
3. Joachim Hartung, Guido K., and Bimal, K. S. 2008. Statistical Meta Analysis with Applications. John Wiley dan Sons, Inc., Publication
4. John, E., Hunter, Frank L. and Schmidt. 2004. Methods of Meta Analysis. Sage Publications, Inc.
5. Larry, V., Hedenganes, and Ingram, O. 1985. Statistical Method for Meta Analysis. New York : Orlando San Diego.
6. Sterne JAC (editor). 2009. Meta-Analysis in Stata: An updated Collection from the Stata Journal. Stata Press.
7. Whitehead, A. 2002. Meta-Analysis of Controlled Clinical Trials. A. Whitehead Copyright. John Wiley dan Sons, Ltd.