

MODULE HANDBOOK

Module Name	:	Data Processing and Analysis
Module Level	:	Bachelor
Abbreviation, if applicable	:	
Sub-heading, if applicable	:	
Semester/ term	:	3
Module Coordinator(s)	:	
Lecturer(s)	:	
Language	:	Indonesian
Classification within the curriculum	:	Mandatory course
Teaching format/ class hours per week during the semester	:	Lecture + student-centered learning/2 x 50 minutes per week
Workload	:	
Credits Points	:	2 credits
Requirements	:	Fundamental Physics 1A & 2A(121)
Learning goals	:	<p>Knowledge:</p> <ul style="list-style-type: none"> (1) Principles of data processing and analysis in physics and in general. (2) Probability distribution functions (3) Principles of statistical inferences (4) Optimization in curve fitting <p>Skill:</p> <ul style="list-style-type: none"> (1) computing statistical parameters (2) determining the appropriate statistical test <p>Competencies:</p> <ul style="list-style-type: none"> (1) Applying statistical hypothesis to make inferences (2) Defining a model based on curve fitting

Content	: Understand about the needs of data processing and analysis in physical sciences and others; basic theories of probability (bayesian and frequentist) and probability density functions; using graphs in presenting data, central tendency and dispersion of data and presenting results of measurements; expectation value of probability density function, binomial distribution, normal distribution and chi squares distribution and their applications; uncertainty and error in measurements and its propagation, systematic and biased errors; confidence interval, single and 2-tails intervals, upper and lower limits of measurements in various probability distributions; statistical hypothesis testing, test if the data agrees with the hypothesis, test if the data does not agree with the hypothesis, test of comparison hypothesis, curve fitting and modelling, least squares or chi-squares criteria, fitting using least squares and maximum likelihood; introduction to multivariate analysis for multivariable models; overview of big data
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