



MODULE HAND BOOK

MECHANICAL ENGINEERING VOCATIONAL EDUCATION STUDY PROGRAM

FACULTY OF ENGINEERING – UNIVERSITAS NEGERI PADANG

COURSE NAME	CODE	Course classification Basic science	CU		Sem	Version
			Theory	Pract		
Statistics	MES1.61.6104	Study Program Compulsory Courses/ Basic science	2	0	6	1
Responsible Lecturer	Prof. Dr. Ambiyar, M.Pd.		Signature _____			
<u>INFORMATION</u>	Dean		Head of Department		Coordinator of study program	
	<u>Dr. Fahmi Rizal, M.Pd., MT</u> NIP. 195912041985031004		<u>Drs. Purwantono, M.Pd</u> NIP. 196308041986031002		<u>Drs. Purwantono, M.Pd</u> NIP. 196308041986031002	
Program Learning Outcomes	Program Learning Outcomes (PLO):					
	1. Possess a good ability to apply the basic science (mathematics and natural sciences) and other disciplines in profesional jobs / projects (Knowledge-understanding) 1.1. possess a good understanding and can apply the basic concept of mathematics to solve various technical					

problems

- 1.2. possess a good understanding and can apply basic the concept of physic to solve various technical problems
- 1.3. possess a good understanding and can apply basic the concept of chemistry to solve various technical problems
2. Possess a critical and creative thinking in identifying, formulating, problem solving and evaluating various problems in mechanical engineering using the most appropriate and effective scientific method (**Engineering analysis, investigations and assessment**):
 - 2.1. problem identification skills
 - 2.2. problem analysis skills
 - 2.3. problem evaluation skills
3. Possess a good ability in designing, manufacturing and operating machines (**Engineering design**)
 - 3.1. able to formulate ideas/concepts into a technical drawing, design and budget plans
 - 3.2. able to operate various machines and other engineering equipment with the correct standard operating procedure
 - 3.3. able to design a machine or machinery system based on a valid scientific theory
 - 3.4. able to realize a concept/design into a prototype, manufacturing process and engineering system
4. Possess a good ability to design, organize and evaluate the education and learning process in *mechanical engineering vocational education*. (**Education design**)
 - 4.1. able to design curriculum and learning process by considering various aspects
 - 4.2. able to organize, control, evaluate and improve the quality of the learning process
 - 4.3. able to develop an interesting, effective and efficient learning medias
5. Possess a good ability to adapt to development in science and technology and apply it into professional jobs by

- considering any non-technical aspects. **(Engineering practice)**
- 5.1. able to innovate and develop technology in the field of mechanical engineering by considering social, economic and environmental aspects
- 5.2. able to carry out the optimization process and increase the efficiency of machines or machining system.
- 5.3. able to improve the performance of machine/ machinery system by applying the information technology
- 6. Possess a good softskil and spirit of lifelong learning **(Transferable skill / softskill)**
 - 6.1. possess a religious character
 - 6.2. possess a spirit of nasionalisme, social sensitivity and environmental consevation orientation
 - 6.3. possess the ability to communicate effectively and work together in teamwork
 - 6.4. possess the ability to transfer science and technology to society to improve the quality of life
 - 6.5. possess a good characters of entrepreneur

Couse Learning Outcomes

Couse Learning Outcomes (CLO)

CLO	PLO
1. Students are able to define statistical concepts	1.1, .2.2
2. Mastering the concept of data and its presentation	1.1, 2.2
3. Be able to define hypotheses	1.1
4. Able to evaluate the feasibility of data based on testing requirements analysis using manual methods	1.1

	and computer applications		
	5. Able to analyze data with appropriate techniques using computer applications	1.1,	
Course descriptions	This course provide students with basic knowledge of statistics with application to application and interpretation, including statistical concepts, data, measurement scale, selection of statistical analysis for research problems, various kinds of correlation analysis, regression, comparison, testing requirements analysis, hypothesis testing.		
References	Main references (RU):		
	1. Sudjana. 2005. Statistical Methods. Bandung: Tarsito. 2. Sugiyono. 2009. Statistics for Research. Bandung: CV Alfabeta		
	Additional references (RP)		
	1. Riadi, E. 2016. Research Statistics (Manual analysis and IBM SPSS. Publisher Andi		
Learning Media	Software:	Hardware:	
		Computer, LCD Projector and Whiteboard and peripherals	
Team Teaching			
Assessment	UTS, UAS, Assignments		
Requirements Subject			

COURSE SUBJECTS

Week	Expected competencies	Topics	Method and strategy for learning	Assignment	Criterion / Assessment indicator	References
(1)	CLO-1, Students are able to define statistical concepts	Definition of statistics, role, importance, function and distribution of statistics	Material explanation [60 ' Question and answer [1x40 ']	<ul style="list-style-type: none"> Make a summary and description of the material presented in the resume book 	Able to define statistics, roles, interests, functions and share statistics	RU-1, RU-2, RP-1
(2)	CLO-2: Student mmaster the concept of data, data distribution and presentation CLO 2.1: Be able to identify types of data	rules for rounding numbers, types of data and measurement scale, definition and part of the frequency distribution	Material explanation [60 ' Question and answer [1x10 ' exercises [1x30 ']	<ul style="list-style-type: none"> Make a summary and description of the material presented in the resume book Group discussion on the rules for rounding numbers, types of data and measurement scale, definition and part of the frequency distribution 	Able to apply rounding rules of numbers, be able to define data, measurement scale, and frequency distribution	RU-1, RU-2, RP-1

Week	Expected competencies	Topics	Method and strategy for learning	Assignment	Criterion / Assessment indicator	References
(3)	CLO 2.2: Able to calculate central tension	Quartile, decile, percentile, mean, median and mode	Material explanation [60 '] Question and answer [1x10 '] exercises [1x30 ']	<ul style="list-style-type: none"> • Make a summary and description of the material presented in the resume book • exercises 	Be able to calculate kuartile, decile, percentile, mean, median and mode	RU-1, RU-2, RP-1
(4)	CLO 2.3: Able to calculate variability and standard score	Standard deviation, variance, Z score and T score	Material explanation [60 '] Question and answer [1x10 '] exercises [1x30 ']	<ul style="list-style-type: none"> • Make a summary and description of the material presented in the resume book • exercises 	Be able to count Standard deviation, variance, Z score and T score	RU-1, RU-2, RP-1
(5)	CLO 2.4: Able to present data based on its distribution	type of frequency distribution, single and grouped frequency distribution, type of graph / diagram,	Material explanation [60 '] Question and answer [1x10 '] exercises [1x30 ']	<ul style="list-style-type: none"> • Make a summary and description of the material presented in the resume book • exercises 	Able to present data based on dsingle and group frequency distribution with various types of graphs / diagrams	RU-1, RU-2, RP-1

Week	Expected competencies	Topics	Method and strategy for learning	Assignment	Criterion / Assessment indicator	References
(6)	CLO-4 Students are able to evaluate the feasibility of data based on testing the analysis requirements using manual methods and computer applications	Normal curve, application of normal curve table, normal curve and Z score	Material explanation [60 '] Question and answer [1x10 '] group discussion [1x30 ']	<ul style="list-style-type: none"> • Make a summary and description of the material presented in the resume book • Group discussion about normal curve, application of normal curve table, normal curve and Z score 	Able to identify normal curve, able to apply normal curve table, normal curve and Z score	RU-1, RU-2, RP-1
7	CMPK-3: Be able to define hypotheses	The null hypothesis, the alternative hypothesis, the research hypothesis and statistics, the form of the hypothesis	Material explanation [60 '] Question and answer [1x10 '] group discussion [1x30 ']	<ul style="list-style-type: none"> • Make a summary and description of the material presented in the resume book • Group discussion on null hypothesis, alternative hypothesis, research hypothesis and statistics, hypothesis form 	Be able to define null hypothesis, alternative hypothesis, research hypothesis and statistics, hypothesis form	RU-1, RU-2, RP-1
(8)	MIDTERM EXAM					

Week	Expected competencies	Topics	Method and strategy for learning	Assignment	Criterion / Assessment indicator	References
(9)	CLO-5: Able to analyze data with appropriate techniques using computer applications	Definition of Correlation Types of correlation and hypothesis testing	Material explanation [60 ' Question and answer [1x10 ' group discussion [1x30 '	<ul style="list-style-type: none"> • Make a summary and description of the material presented in the resume book • Group discussion on types of correlation and hypothesis testing 	Be able to identify types of korrelation and hypothesis testing	RU-1, RU-2, RP-1
(10)	CLO-4: Able to evaluate the feasibility of data based on testing requirements analysis using manual methods and computer applications	Validity and Reliability Test Normality test	Material explanation [60 ' Question and answer [1x10 ' exercises [1x30 '	<ul style="list-style-type: none"> • Make a summary and description of the material presented in the resume book • Exercise questions about Validity and Reliability Test, Normality Test 	Able to evaluate the feasibility of data based on the Validity and Reliability Test, Normality Test	RU-1, RU-2, RP-1
(11)	CLO-4: Able to evaluate the feasibility of data based	Homogeneity Test of Variance Linearity Test	Material explanation [60 ' Question and answer [1x10 ' exercises [1x30 '	<ul style="list-style-type: none"> • Make a summary and description of the material presented in the 	Able to evaluate the feasibility of data based on Homogeneity Test of Variance	RU-1, RU-2, RP-1

Week	Expected competencies	Topics	Method and strategy for learning	Assignment	Criterion / Assessment indicator	References
	on testing requirements analysis using manual methods and computer applications			resume book <ul style="list-style-type: none"> Exercise questions on Homogeneity Test, Variance, Linearity Test 	Linearity Test	
(12)	CLO-5: Able to analyze data with appropriate techniques using computer applications	Single regression analysis	Material explanation [60 ' Question and answer [1x10 ' group discussion [1x30 '	<ul style="list-style-type: none"> Make a summary and description of the material presented in the resume book Group discussion on single regression analysis 	Able to analyze data using a single regression analysis	RU-1, RU-2, RP-1
(13)	CLO-5: Able to analyze data with appropriate techniques using computer applications	Multiple regression analysis	Material explanation [60 ' Question and answer [1x10 ' exercises [1x30 '	<ul style="list-style-type: none"> Make a summary and description of the material presented in the resume book Exercise questions on multiple regression analysis 	Able to analyze data using a multiple regression analysis	RU-1, RU-2, RP-1

Week	Expected competencies	Topics	Method and strategy for learning	Assignment	Criterion / Assessment indicator	References
(14)	CLO-5: Able to analyze data with appropriate techniques using computer applications	Comparative analysis using the mean difference test (T test)	Material explanation [60 '] Question and answer [1x10 '] group discussion [1x30 ']	<ul style="list-style-type: none"> • Make a summary and description of the material presented in the resume book • Group discussion on comparative analysis using the mean difference test (T test) 	Able to analyze data using mean difference test (T test)	RU-1, RU-2, RP-1
(15)	CLO-5: Able to analyze data with appropriate techniques using computer applications	Comparative analysis using the variance test (ANOVA)	Material explanation [60 '] Question and answer [1x10 '] group discussion [1x30 ']	<ul style="list-style-type: none"> • Make a summary and description of the material presented in the resume book • Group discussion on comparative analysis using the variance test (ANOVA) 	Able to analyze data using variance test (ANOVA)	RU-1, RU-2, RP-1
(16)	Final Exams					

Duty		30																						
Presence		10																						
TOTAL		100																						

Assessment Components

Midterm exam (UTS)	: 30%
Final exams (UAS)	: 35%
Assignment	: 30%
<u>Presence</u>	<u>: 35%</u>
Total	: 100%

Scoring/Grading level description

	Excellent	Good	Satisfy	Fail
ability to describe	Able to describe correctly and completely	Able to describe correctly but not complete	Able to describe but less clear and incomplete	Unable to describe
ability to formulate	Able to formulate correctly and completely	Able to formulate correctly but not complete	Able to formulate but less clear and incomplete	Unable to formulate
ability to calculate	Able to calculate correctly and completely	Able to calculate correctly but not complete	Able to calculate but less clear and incomplete	Unable to calculate
ability to analyze	Able to analyze correctly and completely	Able to analyze correctly but not complete	Able to analyze but less clear and incomplete	Unable to analyze

Scoring and grading system

Score	Quality	Quality score	Designation	Score	Quality	Quality score	Designation
85 – 100	A	4.0	Outstanding	55 – 59	C	2.0	Acceptable
80 – 84	A-	3.6	Excellent	50 – 54	C-	1.6	Poor
75 – 79	B+	3.3	Very good	40 – 49	D	1.0	Poor
70 – 74	B	3.0	Good	≤ 39	E	0.0	Fail
65 – 69	B-	2.6	Good	-	T	-	Postpone
60 – 64	C+	2.3	Acceptable				

