



MODULE HAND BOOK

MECHANICAL ENGINEERING VOCATIONAL EDUCATION STUDY PROGRAM

FACULTY OF ENGINEERING – UNIVERSITAS NEGERI PADANG

COURSE NAME	CODE	Course classification	CU		Sem	Version
			Theory	Pract		
Occupational Health and Safety	MES1.61.2201	Study Program Compulsory Courses / Character buildings	2	0	2	1
Responsible	Drs. Irzal, M.Kes., Drs. Jasman, M.Kes.			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	Study Program Program Learning Outcomes (PLO)					
	<ol style="list-style-type: none"> 1. Possess a good ability to apply the basic science (mathematics and natural sciences) and other disciplines in profesional jobs / projects (Knowledge-understanding) <ol style="list-style-type: none"> 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 thingking in identifying, formulating, problem solving and evaluating various problems in mechanical engineering using the most appropriate and effective scientific method (<i>Engineering analysis, investigations and assessment</i>): <ol style="list-style-type: none"> 2.1. problem identification skills 					

	<ul style="list-style-type: none"> 2.2. problem analysis skills 2.3. problem evaluation skills 3. Possess a good ability in designing, manufacturing and operating machines (Engineering design) <ul style="list-style-type: none"> 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 <i>mechanical engineering vocational education</i>. (Education design) <ul style="list-style-type: none"> 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) <ul style="list-style-type: none"> 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) <ul style="list-style-type: none"> 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
Course Learning	Course Learning Outcomes (CLO)

Outcomes	CLO		PLO
	1. Mastering the principles and techniques of integrated system design with a systems approach		2.1, 3.3, 5.1
	2. Able to design an integrated system according to the applicable technical, safety and environmental health standards by taking into account performance and reliability aspects, ease of implementation and sustainability, and taking into account economic, social and cultural factors.		2.1, 3.3, 5.1
	3. Mastering the current principles and issues in economy, social, ecology in general. This ability is in the form of students' ability on comprehensive environmental knowledge and about the importance of environmental preservation in supporting development activities		2.1, 3.3, 5.1
Course descriptions	This course discusses the definition, scope, and knowledge of Occupational Safety and Health (K3) which is integrative program in the industrial world.		
References	Main references (RU)		
	1. Collection of Legislations for Occupational Safety and Health, Directorate of K3 Norms Supervision, Directorate General of Binwasnaker, Kemnakertrans RI, 2005		
	2. Roger L Braurer. 2006. Safety, and Health for Engineers. New York: John Wiley & Sons, Inc		
	Additional references (RP)		
1. Suma'mur PK 1995. Work Safety and Accident Prevention. Jakarta: PT Toko Gunung Agung			
2. Suma'mur PK 1995. Company Hygiene and Occupational Health. Jakarta: PT Toko Gunung Agung			
Learning Media	Software	Hardware	
		Computer, LCD Projector and Whiteboard and peripherals	
Team Teaching			
Assessment	UTS, UAS, quiz		
Requirements Subject	No		

COURSE SUBJECTS

Week	Expected competencies	Topics	Method and strategy for learning	Assignment	Criterion / Assessment indicator	References
(1)	CLO-1.1: [PLO-2.1, 3.3, 6.3] Students are able to know and understand the background of organizing K3 in the industrial world and its relation to production and productivity	preliminary 1. The purpose of safety and occupational health 2. Work Safety and Power Protection Work 3. Work Safety and productivity	Material description [1x70 '] Frequently asked questions [1x10 '] Discussion [1x20 ']	Make a summary and description of the material presented in the resume book	Able to explain the importance of K3, the main targets of work safety in the workplace and the relationship between K3 and production and productivity	RU-1
(2)	CLO-1.2: [PLO-2.1, 3.3, 6.3] Students know rules and regulations concerning K3 that apply in Indonesia	Legal basis and regulations for occupational safety and health. 1. Law No. 1 of 1970 2. Provisions about protection on industry and workers	Material description [1x70 '] Frequently asked questions [1x10 '] Discussion [1x20 ']	Make a summary and description of the material presented in the resume book	Able to explain the K3 rules and regulations that apply in Indonesia	RU-1 and RU-2
(3)	CLO-1.3: [PLO-2.1, 3.3, 6.3] Students understand the benefits of implementing SMK3 and the steps for its implementation	Management system Occupational Health and Safety (K3) 1. Development of SMK3 2. Benefits of implementing SMK3	Material description [1x70 '] Frequently asked questions [1x10 '] Discussion [1x20 ']	Make a summary and description of the material presented in the resume book	Able to explain SMK3 and outline SMK3	RU-1 and RU-2
(4)	CLO-1.4: [PLO-2.1, 3.3, 6.3]	Work safety and accident prevention	Material description [1x70 '] Frequently asked questions	Make a summary and description of the	Able to explain occupational	RU-1 and RU-2

Week	Expected competencies	Topics	Method and strategy for learning	Assignment	Criterion / Assessment indicator	References
	Students know and understand the concept basic safety, accidents, and the scope of prevention accidents in the industry	a. The concept of safety and occupational health b. Principles and methods accident prevention	[1x10 '] Discussion [1x20 ']	material presented in the resume book	safety and health concepts and accident prevention principles and methods	
(5)	CLO-2.1: [PLO-2.1, 3.3, 6.3, 6.4] Students know causes of work accidents and how to prevent them work accident	Work Accidents in Industry 1. The theory of occurrence work accident 2. Causes of Accidents Work 3. Classification of Accidents Work	Material description [1x70 '] Frequently asked questions [1x10 '] Discussion [1x20 ']	Make a summary and description of the material presented in the resume book	Be able to explain the theory of work accidents and provide examples of the causes of work accidents and their classifications	RU-1 and RU-2
(6)	CLO-2.2: [PLO-2.1, 3.3, 6.3, 6.4] Students know problems and work hazards and able to analyze work accidents	Work Accident Analysis 1. Identify hazards and the cause 2. Work accident statistics	Material description [1x70 '] Frequently asked questions [1x10 '] Discussion [1x20 ']	Make a summary and description of the material presented in the resume book	Able to explain how to recognize hazards and their causes, and to calculate accident frequency and severity	RU-1 and RU-2
(7)	CLO-1.1-2.2: [PLO-2.1, 3.3, 6.3, 6.4] Students are able to complete issues	Study material from the 1st meetings / d 6	Quiz [1x100 ']	Complete issues related to the material that has been delivered	Mable to do issues related to the material which has	

Week	Expected competencies	Topics	Method and strategy for learning	Assignment	Criterion / Assessment indicator	References
	related to the material that has been delivered				be delivered	
(8)	Mid-Test					
(9)	CLO-2.3: [PLO-2.1, 3.3, 6.3, 6.4] Students know the scope of hygiene and sanitation in the industry as well as knowing various formal policies or regulations regarding hygiene and sanitation applies in the industry	Hygiene and industrial sanitation 1. Definition of hygiene and industrial sanitation. 2. The aspects that are related to the source disease. 3. Regulations and hygiene legislation and sanitation. 4. Environmental monitoring work.	Material description [1x70 '] Frequently asked questions [1x10 '] Discussion [1x20 ']	Make a summary and description of the material presented in the resume book	Be able to explain understanding hygiene and sanitation, providing examples and explaining sources disease, do monitoring work environment	RU-1 and RU-2
(10)	CLO-2.4: [PLO-2.1, 3.3, 6.3, 6.4] Students know various types of diseases that can be caused by risky jobs, along with various prevention efforts	Occupational illness • Causes of occupational diseases • Types of occupational diseases • Prevention of occupational diseases	Material description [1x70 '] Frequently asked questions [1x10 '] Discussion [1x20 ']	Make a summary and description of the material presented in the resume book	Be able to explain various causative factors occupational diseases and occupational diseases and their prevention	RU-1 and RU-2
(11)	CLO-2.5: [PLO-2.1, 3.3, 6.3, 6.4]	Personal protective equipment	Material description [1x70 '] Frequently asked questions	Make a summary and description of the	Mable to provide examples and	RU-1 and RU-2

Week	Expected competencies	Topics	Method and strategy for learning	Assignment	Criterion / Assessment indicator	References
	Students know the Personal Protective Equipment according to the type of work	<ul style="list-style-type: none"> • Eye and face protection • Skin and body protection • Respiratory protection • Hearing protection 	[1x10 '] Discussion [1x20 ']	material presented in the resume book	explain Personal Protective Equipment in accordance with the type of work	
(12)	CLO-2.6: [PLO-2.1, 3.3, 6.3, 6.4] Students know handling and storage of chemicals	Handling Safety Chemical material <ul style="list-style-type: none"> • Material Safety Data Sheet (MSDS) • Storage of chemicals 	Material description [1x70 '] Frequently asked questions [1x10 '] Discussion [1x20 ']	Make a summary and description of the material presented in the resume book	Mis able to provide examples of how to work safely with hazardous chemicals	RU-1 and RU-2
(13)	CLO-3.1: [PLO-2.1, 3.3, 6.3, 6.4] Students know and understand the aspects of prevention work accidents that can occur in industry, both in the goods and services industry, which include mechanical hazards and electrical hazards	Safety facet Mechanical and Electrical <ol style="list-style-type: none"> 1. Types of mechanical hazards. 2. Protection techniques mechanical hazard. 3. Types of electrical hazards. 4. Protection technique against electrical hazard 	Material description [1x70 '] Frequently asked questions [1x10 '] Discussion [1x20 ']	Make a summary and description of the material presented in the resume book	Mable to provide examples of how to prevent accidents caused by mechanical and electrical aspects	RU-1 and RU-2
(14)	CLO-3.2: [PLO-2.1, 3.3, 6.3, 6.4] Students understand and know the prevention and overcoming of fire hazards and types fire-fighting equipment and materials	Fire Hazard Protection <ol style="list-style-type: none"> 1. Causes of harm Fire. 2. Various types fire, prevention, and countermeasures. 3. Detection equipment Fire. 	Material description [1x70 '] Frequently asked questions [1x10 '] Discussion [1x20 ']	Make a summary and description of the material presented in the resume book	Mis able to provide examples and explain all efforts to prevent fire hazards	RU-1 and RU-2

Week	Expected competencies	Topics	Method and strategy for learning	Assignment	Criterion / Assessment indicator	References
		4. Extinguishing equipment fire				
(15)	CLO-2.3-3.2: [PLO-2.1, 3.3, 6.3, 6.4] Students are capable complete issues related to the material that has been delivered	Study material from the 9th meetings / d 14	Quiz [1x100']	Complete issues related to the material that has been delivered	Mable to do issues related to the material that has been delivered	
(16)	Final Test					

Note : 1 credit = (50 'TM + 60' BT + 60 'BM) / Week
 TM = Face to Face (Lecture)
 BT = Structured Learning.
 BM = Independent Study
 PS = Simulation Practicum (160 minutes / week)
 PL = Laboratory Practicum (160 minutes / week)
 T = Theory (aspects of science)
 P = Practice (aspects of work skills)

The linkage between CLO and PLO and assessment methods

MES1.61.2201	Assessment	Weight (%)	PLO-1			PLO-2			PLO-3				PLO-4			PLO-5			PLO-6				
			1	2	3	1	2	3	1	2	3	4	1	2	3	1	2	3	1	2	3	4	5
CLO-1.1	UTS. 1	5				V					V										V	V	
CLO-1.2	UTS. 2	5				V					V										V	V	
CLO-1.3	UTS. 3	5				V					V										V	V	
CLO-1.4	UTS. 4	5				V					V										V	V	
CLO-2.1	UTS.5.1	2.5				V					V										V		
CLO-2.2	UTS.5.2	2.5				V					V										V		
CLO-2.3	UAS. 1	5				V					V										V		
CLO-2.4	UAS. 2	5				V					V										V		
CLO-2.5	UAS. 3	5				V					V										V		

CLO-2.6	UAS. 4	5				V					V									V		
CLO-3.1	UAS.5.1	2.5				V					V									V		
CLO-3.2	UAS.5.2	2.5				V					V									V		
CLO-1.1-2.2	Quiz	20				V					V									V		
CLO-2.3-3.2	Quiz	20				V					V									V		
Presence		10																				
TOTAL		100																				

Assessment Component

Midterm exam (UTS)	: 25%
Final exams (UAS)	: 25%
Quiz	: 40%
<u>Presence</u>	<u>: 10%</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	-	Tertunda
60 – 64	C+	2.3	Acceptable				

