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		
Industrial Management	MES1.61.6102	Study Program Compulsory Courses MEVE core course	2	0	6	1
Responsible	Drs. Hasanddun, MS, Drs. Muh. Taufik Pinat, MDP		Signature _____			

INFORMATION	**Dean**	**Head of Department**	**Coordinator of study program**
	Dr. Fahmi Rizal, M.Pd., MT NIP. 195912041985031004	Drs. Purwantono, M.Pd NIP. 196308041986031002	Drs. Purwantono, M.Pd 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 thingking 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

<table>
<tr><td>Course Learning Outcomes</td><td>Course Learning Outcomes (CLO)
<table>
<tr><th>CLO</th><th>PLO</th></tr>
<tr><td>1. Basic understanding of industry and the concept of the importance of industrial management,</td><td>2.1, 2.2, 2.3, 4.1, 5.1, 5.2, 5.3, 6.4, 6.5</td></tr>
<tr><td>2. Industry form & classification,</td><td>2.1, 2.2, 2.3, 4.1, 5.1, 5.2, 5.3, 6.4, 6.5</td></tr>
<tr><td>3. Project activities & industrial organizations</td><td>2.1, 2.2, 2.3, 4.1, 5.1, 5.2, 5.3, 6.4, 6.5</td></tr>
<tr><td>4. Product development linkages and project activities</td><td>2.1, 2.2, 2.3, 4.1, 5.1, 5.2, 5.3, 6.4, 6.5</td></tr>
<tr><td>5. Project analysis and scheduling techniques & methods,</td><td>2.1, 2.2, 2.3, 4.1, 5.1, 5.2, 5.3, 6.4, 6.5</td></tr>
<tr><td>6. Production planning & process selection, as well as rules for prioritizing work, machine calculations & supplies</td><td>2.1, 2.2, 2.3, 4.1, 5.1, 5.2, 5.3, 6.4, 6.5</td></tr>
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<tr><td>Short course descriptions</td><td>This course provides knowledge about the fundamentals of management and the history of development management; Industrial system organization; Human resources aspect; Product development, principal return point analysis; Cost evaluation and investment evaluation with risk considerations; Definition of cash flow and how to prepare it.</td></tr>
<tr><td>References</td><td>Main references (RU):
1. Eddy Rasman Rasyid (2001), Principal Signs of Project Management, Caraka Merdesa Publsh, Jakarta
2. Hasanuddin (2000), Operational Management / Production Management Lecture Module, MM UNP Padang
3. Muljadi Pudjosumarto (1988), Project Evaluation, Liberty, Yogyakarta
4. Render & Heizer (1995), Operations Management, Salemba Empat., Jakarta

Additional references (RP)
1. Soekartawi (1987), Basic Project Evaluation, Bina Ilmu, Surabaya
2. T. Hanihandoko (1982), Production Management, FE UGM, Yogyakarta
3. Ulrich & Eppinger (2001), Product Design and Development, Salemba Teknika Jakarta</td></tr>
<tr><td>Learning Media</td><td>Software:</td><td>Hardware:
Computer, LCD Projector and Whiteboard and peripherals</td></tr>
<tr><td>Team Teaching</td><td colspan="2"></td></tr>
<tr><td>Assessment</td><td colspan="2">Mid-Term Exam, Final Exam, Independent Assignment, Discussion Assignment</td></tr>
<tr><td>Requirements Subject</td><td colspan="2">No</td></tr>
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COURSE SUBJECTS

Week	Expected competencies	Topics	Method and strategy for leraning	Assignment	Criterion / Assessment indicattor	References
(1)	**CLO-1: [PLO-6.4,6.5]** Students are capable Critical and rational thinking to implement the project concept & industrial systems in managerial aspects	• Definition of Management • Definition of Project and Industry • Definition of Project and Industrial Management • Examples of Project activities	Material explanation **[1x75 ']** Question and answer **[1x10 ']** Discussion **[1x15 ']**	Make a summary and description of the material presented in the resume book	Able to implement project concepts & industrial systems in managerial aspects	RU-1, RU-2 and RU-3
(2)	**CLO-2: [PLO-5.2]** Students are able to think critically to understand project initiation, characteristics & project requirements in an industry	• Project initiation • Forms and Types of Projects in Industry • Project Cycle in Industry • Project Costs in Industry	Material explanation **[1x60 ']** Question and answer **[1x10 ']** Work on assignments **[1x30 ']**	• Make a summary and description of the material presented in the resume book • Task work on questions	Able understand project initiation, characteristics & project requirements in an industry	RU-1, RU-2 and RU-3
(3)	**CLO-3: [PLO-6.3,6.5]** Students are capable understand about the characteristics of Project managers and Organizational structures in Industry	• Know General Manager Skills • Characteristics of project managers in industry • Leadership Style • Project Organizational Model and Structure in Industry	Material explanation **[1x60 ']** Question and answer **[1x10 ']** Work on assignments **[1x30 ']**	• Make a summary and description of the material presented in the resume book • Task work on questions	Able understand about the characteristics of Project managers and Organizational structures in Industry	RU-1, RU-2 and RU-3

Week	Expected competencies	Topics	Method and strategy for leraning	Assignment	Criterion / Assessment indicattor	References
(4)	**CLO-4: [CP-5.1,6.5]** Students are capable understand the aspects of product development in industry / engineering	• Definition of Products • Product Development Flowchart • Decision Making Steps in Development Product	Material explanation [1x60 '] Question and answer [1x10 '] Work on assignments [1x30 ']	• Make a summary and description of the material presented in the resume book • Task work on questions	Able understand the aspects of product development in industry / engineering	RU-1, RU-2 and RU-3
(5)	**CLO-5.1: [CP-1.1,2.3,6.5]** Students are capable apply the basic concepts of industrial economics analysis	• Concept of Technical and Efficiency • Economy Project evaluation procedures & Investment Criteria • The Time Value Concept of Money • Types of Flowers	Material explanation [1x60 '] Question and answer [1x10 '] Work on assignments [1x30 ']	• Make a summary and description of the material presented in the resume book • Task work on questions	Able apply the basic concepts of industrial economics analysis.	RU-1, RU-2, RU-3 and RU-4
(6)	**CLO-5.2: [CP-2.1, 2.2, 2.3, 3.3]** Students are capable apply the basic concepts of Economic analysis in industry	• The concept of the relationship between the value of money over time & Equivalence • Usage Table of interest • Investment Criteria and Project Feasibility in the industry	Material explanation [1x60 '] Question and answer [1x10 '] Work on assignments [1x30 ']	• Make a summary and description of the material presented in the resume book • Task work on questions	Able apply the basic concepts of Economic analysis in industry	RU-1, RU-2, RU-3 and RU-4
(7)	**CLO-5.3: [CP-1.1,2.3,6.5]** Students are able to explain type & classification of production costs as well	• Definition and Types of Production Process Costs • Break Even Point Analysis (break Event	Material explanation [1x60 '] Question and answer [1x10 '] Work on assignments [1x30 ']	• Make a summary and description of the material presented in the resume book	Be able to explain type & classification of production costs as well as break-even	RU-1, RU-2, RU-3 and RU-4

Week	Expected competencies	Topics	Method and strategy for leraning	Assignment	Criterion / Assessment indicattor	References
	as break-even point analysis	Point) • Production Asset Depreciation		• Task work on questions	point analysis	
(8)	**Mid-Test (UTS)**					
(9)	**CLO-5.4: [CP-1.1,2.3,6.5]** Students are capable apply the concept of planning, scheduling and project supervision in industry	• Definition of production scheduling • Rule Scheduling Techniques to Prioritize Work	Material explanation [1x60 '] Question and answer [1x10 '] Work on assignments [1x30 ']	• Make a summary and description of the material presented in the resume book • Task work on questions	Able apply the concept of planning, scheduling and project supervision in industry	RU-1, RU-2, RU-3 and RU-4
(10)	**CLO-6: [CP-3.4,2.3,6.5]** Students are able to understand knowledge about Production & process	Definition of production & productivity as well as the type / selection of process strategies	Material explanation [1x60 '] Question and answer [1x10 '] Work on assignments [1x30 ']	• Make a summary and description of the material presented in the resume book • Task work on questions	Able to understand knowledge about Production & process).	RU-1, RU-2, RU-3 and RU-4
(11)	**CLO-5.5:: [CP-1.1,2.3,6.5]** Students are able to knowabout the concept of the rules for prioritizing work	Scheduling functions and rules prioritize work	Material explanation [1x70 '] Question and answer [1x10 '] Work on assignments [1x30 ']	• Make a summary and description of the material presented in the resume book • Task work on questions	Able to master about the concept of the rules for prioritizing work	RU-1, RU-2, RU-3 and RU-4
(12)	**CLO-5.6:: [CP-1.1,2.3,6.5]** Students are able to explain Scheduling and sequencing of jobs at machining / work centers in industry	Scheduling and Johnson's rules for sorting jobs	Material explanation [1x60 '] Question and answer [1x10 '] Discussion [1x30 ']	• Make a summary and description of the material presented in the resume book	Be able to explain Scheduling and sequencing of jobs at machining / work centers in industry	RU-1, RU-2, RU-3 and RU-4

Week	Expected competencies	Topics	Method and strategy for leraning	Assignment	Criterion / Assessment indicattor	References
(13)	**CLO-6.1: [CP-3.4,2.3,6.5]** Students are able to analyze time calculations and the machining process	• Understanding Calculation of time • Time calculation method • Application to the machining work process	Material explanation [1x60 '] Question and answer [1x10 '] Discussion [1x30 ']	• Make a summary and description of the material presented in the resume book	Able to master time calculation and machining process	RU-1, RU-2, RU-3 and RU-4
(14)	**CLO-6.2: [PLO-3.4,2.3,6.5]** Students are able to analyze Calculation of Machining Operation Costs	• Definition and Concept of Operating Costs • Calculation of Costs in Machining Works	Material explanation **[1x60 ']** Question and answer **[1x10 ']** Discussion **[1x30 ']**	• Make a summary and description of the material presented in the resume book • Discussion	Able to master Calculation of Machining Operation Costs	RU-1, RP-1, RP-2 and RP-3
(15)	**CLO-6.3: [PLO-3.4,2.3,6.5]** Students are able to understand about Material Inventory/logistics	• Definition of Inventory Management • Types and Classification of Inventory • Engineering and Metode Determination of logistics Inventory	Material explanation [1x70 '] Question and answer [1x10 '] Discussion[1x30 ']	• Make a summary and description of the material presented in the resume book • Discussion	Able to master understanding about Material Inventory/logistics	RU-1, RU-3 RU-5
(16)	**Final Test (UAS)**					

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

MSN1.62.4007	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	UTS. 1	5																				V	V
CLO-2	UTS. 2	7.5															V						
CLO-3	UTS. 3	7.5																			V		V
CLO-4	UTS. 4	3.75														V							V
CLO-5.1	UTS. 5	3.75	V					V															V
CLO-5.2	UTS. 6	3.75				V	V	V			V												
CLO-5.3	UTS. 7	3.75	V					V															V
CLO-5.4	UAS. 1	7.5	V					V															V
CLO-6	UAS. 2	7.5						V				V											V
CLO-5.5	UAS. 3	7.5	V					V															V
CLO-5.6	UAS. 4	7.5	V					V															V
CLO-6.1	UAS. 5	5						V				V											V
CLO-6.2	Discussion	20						V				V											V
CLO-6.3	Discussion	20																					
Presence		10																					
TOTAL		100																					

Assessment Component

Midterm exam (UTS)	: 35%
Final exams (UAS)	: 35%
Assignment	: 20%
Presence	: 10%
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 analysize 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				