	Universitas Negeri Surabaya Faculty of Engineering, Mechanical Engineering Undergraduate Study Program	Document Code

SEMESTER LEARNING PLAN

Courses	CODE	Course Family	Credit Weight			SEMESTER	Compilation Date
Engineering & Cost Analysis	2120103005		T=3	P=0	ECTS=4.77	0	July 18, 2024

AUTHORIZATION	SP Developer	Course Cluster Coordinator	Study Program Coordinator
	.....	.....	Ir. Priyo Heru Adiwibowo, S.T., M.T.

Learning model	**Case Studies**
Program Learning Outcomes (PLO)	**PLO study program that is charged to the course**
	Program Objectives (PO)
	PLO-PO Matrix

	P.O

PO Matrix at the end of each learning stage (Sub-PO)

P.O	Week															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

Short Course Description	This course contains basic concepts of engineering and cost analysis, calculating the value of money against time based on the interest principle, economic analysis and selecting alternatives in machining engineering projects.
References	**Main :**
	1. E. Paul DeGarmo, William G. Sullivan, James A Bontadelli, Elin M. Wicks, Ekonomi Teknik, PT. Prenhallindo, Jakarta, 1999 2. I Nyoman Pujawan, Ekonomi Teknik, Penerbit Guna Widya, Surabaya, 2012
	Supporters:
Supporting lecturer	Dyah Riandadari, S.T., M.T.

Week-	Final abilities of each learning stage (Sub-PO)	Evaluation		Help Learning, Learning methods, Student Assignments, [Estimated time]		Learning materials [References]	Assessment Weight (%)
		Indicator	Criteria & Form	Offline (*offline*)	Online (*online*)		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)

1	Students are able to explain their understanding of the basic concepts of technical economics and cost concepts.	1. Explain the basic concepts of technical economics 2. Explain the concept of fare.		Lectures, discussions. 3 X 50			0%
2	Students are able to explain their understanding of the value of money and time as well as interest calculations.	1. Explain the value of money relative to time 2. Explain interest calculation.		Lectures, discussions, exercises. 3 X 50			0%
3	Students are able to explain their understanding of calculations to find the future value if the present value is known and vice versa.	1. Explain how to calculate the future value if the present value is known 2. Explains how to calculate the present value if the future value is known.		Lectures, discussions, exercises. 3 X 50			0%
4	Students are able to explain their understanding of calculating the compounding factor for a uniform series (A) to find Future (F) and Present (P) values.	1. Explain the calculation of the compounding factor for a uniform series (A) to find the Future value (F)2. Explain the calculation of the compounding factor for a uniform series (A) to find the Present value (P)	**Criteria:** null	Lectures, discussions, exercises. 3 X 50			0%
5	Students are able to explain their understanding of irregular cash flow calculations and Gradient series (G).	1. Explain the calculation for irregular cash flow2. Explain the calculations for the Gradient series (G).	**Criteria:** null	Lectures, discussions, exercises. 3 X 50			0%
6	Students are able to explain their understanding of determining MARR and selecting economic alternatives using the present value (P) method.	1. Explain the determination of MARR2. Explain the calculation of economic alternatives using the present value (P) method		Lectures, discussions, exercises. 3 X 50			0%
7	Students are able to explain their understanding of selecting economic alternatives using the uniform series method (A) and calculating return on capital.	1. Explain the calculation of economic alternatives using the uniform series method (A)2. Explain the calculation of return on capital.	**Criteria:** null	Lectures, discussions, exercises. 3 X 50			0%
8	Midterm Exam (UTS).	Able to explain the monetary value of time and be able to choose the technical alternative that is considered the most profitable.	**Criteria:** Compliance with the answer key.	Midterm Exam (UTS). 3 X 50			0%

9	Students are able to explain their understanding of selecting economic alternatives using the ROR method.	Explains the calculation of economic alternatives using the ROR method.		Lectures, discussions, exercises. 3 X 50			0%
10	Students are able to explain their understanding of break-even analysis.	Explain the calculation of the break-even point.		Lectures, discussions, exercises. 3 X 50			0%
11	Students are able to explain their understanding of sensitivity analysis.	Explains sensitivity analysis calculations.		Lectures, discussions, exercises. 3 X 50			0%
12	Students are able to explain their understanding of calculating depreciation using the straight line method and the decreasing balance method.	1. Explain the calculation of depreciation using the straight line method2. Explain the calculation of depreciation using the declining balance method.	**Criteria:** null	Lectures, discussions, exercises. 3 X 50			0%
13	Students are able to explain their understanding of calculating depreciation using the sinking fund method, and changing depreciation methods.	1. Explain the calculation of depreciation using the sinking fund method2. Explain the calculation of changing depreciation methods.	**Criteria:** null	Lectures, discussions, exercises. 3 X 50			0%
14	Students are able to explain their understanding of the influence of taxes on technical and cost analysis.	Explain the effect of taxes on technical and cost analysis.	**Criteria:** null	Lectures, discussions, exercises. 3 X 50			0%
15	Students are able to explain their understanding of the replacement analysis of defender and challenger concepts as well as the concept of sunk costs.	1. Explain the analysis of replacing the concepts of defender and challenger2. Explain the replacement analysis of the sunk cost concept.	**Criteria:** null	Lectures, discussions, exercises. 3 X 50			0%
16	Students are able to explain their understanding of replacement analysis based on an outside perspective and the economic life of an asset.	1. Explain replacement analysis based on an outside perspective 2. Explains replacement analysis based on the economic life of an asset.	**Criteria:** null	Lectures, discussions. 3 X 50			0%

Evaluation Percentage Recap: Case Study

No	Evaluation	Percentage
		0%

Notes

1. **Learning Outcomes of Study Program Graduates (PLO - Study Program)** are the abilities possessed by each Study Program graduate which are the internalization of attitudes, mastery of knowledge and skills according to the level of their study program obtained through the learning process.
2. **The PLO imposed on courses** are several learning outcomes of study program graduates (CPL-Study Program) which are used for the formation/development of a course consisting of aspects of attitude, general skills, special skills and knowledge.

3. **Program Objectives (PO)** are abilities that are specifically described from the PLO assigned to a course, and are specific to the study material or learning materials for that course.
4. **Subject Sub-PO (Sub-PO)** is a capability that is specifically described from the PO that can be measured or observed and is the final ability that is planned at each learning stage, and is specific to the learning material of the course.
5. **Indicators for assessing** ability in the process and student learning outcomes are specific and measurable statements that identify the ability or performance of student learning outcomes accompanied by evidence.
6. **Assessment Criteria** are benchmarks used as a measure or measure of learning achievement in assessments based on predetermined indicators. Assessment criteria are guidelines for assessors so that assessments are consistent and unbiased. Criteria can be quantitative or qualitative.
7. **Forms of assessment:** test and non-test.
8. **Forms of learning:** Lecture, Response, Tutorial, Seminar or equivalent, Practicum, Studio Practice, Workshop Practice, Field Practice, Research, Community Service and/or other equivalent forms of learning.
9. **Learning Methods:** Small Group Discussion, Role-Play & Simulation, Discovery Learning, Self-Directed Learning, Cooperative Learning, Collaborative Learning, Contextual Learning, Project Based Learning, and other equivalent methods.
10. **Learning materials** are details or descriptions of study materials which can be presented in the form of several main points and sub-topics.
11. **The assessment weight** is the percentage of assessment of each sub-PO achievement whose size is proportional to the level of difficulty of achieving that sub-PO, and the total is 100%.
12. TM=Face to face, PT=Structured assignments, BM=Independent study.