



**Universitas Negeri Surabaya
Faculty of Engineering
Civil Engineering Undergraduate Study Program**

Document Code

SEMESTER LEARNING PLAN

Courses	CODE	Course Family	Credit Weight	SEMESTER	Compilation Date
Value Engineering	2220102099	Compulsory Study Program Subjects	T=2 P=0 ECTS=3.18	6	July 17, 2024
AUTHORIZATION	SP Developer		Course Cluster Coordinator		Study Program Coordinator
	Ir. Mas Suryanto HS., S.T., M.T.			Yogie Risdianto, S.T., M.T.

Learning model	Project Based Learning																																																																			
Program Learning Outcomes (PLO)	PLO study program that is charged to the course																																																																			
	Program Objectives (PO)																																																																			
	PO - 1 Students are able to have knowledge about value engineering to be used in carrying out civil engineering work in the field.																																																																			
	PO - 2 Students are able to carry out value engineering in order to intelligently choose and use appropriate software, technology and construction methods in carrying out work in the field professionally by considering cost targets, schedule and project quality.																																																																			
	PLO-PO Matrix																																																																			
	<table border="1" style="margin: auto;"> <tr><td>P.O</td></tr> <tr><td>PO-1</td></tr> <tr><td>PO-2</td></tr> </table>	P.O	PO-1	PO-2																																																																
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PO Matrix at the end of each learning stage (Sub-PO)																																																																				
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Short Course Description This course contains the history of development, basic concepts, organization and implementation of value engineering; the concepts of value, cost, and function in value engineering; value engineering techniques and work plans consisting of information phases (breakdown analysis, cost models, function analysis); speculation phase; analysis phase; development phase; recommendation phase; and implementation phase.

References

Main :

- Anonimus. 1998. Kumpulan Bahan Kuliah Manajemen Proyek Konstruksi ITS . Surabaya: ITS.
- Dell 19isola Alphonse J. 1982. Value Engineering in the Construction Industry, Edisi ke-3 . New York: Van Nostrand Reinhold.
- Soeharto, Iman. 2001. Manajemen Proyek Dari Konseptual Sampai Operasional Jilid 2 . Jakarta: Penerbit Erlangga.
- Venkataraman Ray R., Pinto Jeffrey K. 2008. Cost and Value Management in Projects . New Jersey: John Wiley & Sons
- Berawi, Mohammed Ali. 2014. Aplikasi Value Engineering pada Industri Konstruksi Bangunan Gedung. Jakarta: Penerbit Universitas Indonesia.

Supporters:

- Journal of Construction Engineering and Management (ASCE)

Supporting lecturer Drs. Hasan Dani, M.T.
Ir. Mas Suryanto H.S., S.T., M.T.
Alwan Gangsar Brilian Putra, S.Tr.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	Know the history of the development of value engineering.	Students can describe the history of the development of value engineering.	<p>Criteria: Good marks if questions are answered correctly.</p> <p>Form of Assessment : Participatory Activities</p>	Lectures, discussions and questions and answers. 2 X 50	Lectures and questions and answers. 2 X 50	<p>Material: History of Value Engineering Bibliography: <i>Berawi, Mohammed Ali. 2014. Application of Value Engineering in the Building Construction Industry. Jakarta: University of Indonesia Publishers.</i></p> <hr/> <p>Material: History of Value Engineering Bibliography: <i>Anonymous. 1998. Collection of ITS Construction Project Management Lecture Materials. Surabaya: ITS.</i></p>	5%
2	Understand the Basic Concepts of Value Engineering (Background & Definition of Value Engineering).	Students can describe the Background & Definition of Value Engineering.	<p>Criteria: Good marks if questions are answered correctly.</p> <p>Form of Assessment : Participatory Activities</p>	Lectures, discussions and questions and answers. 2 X 50	Lectures and questions and answers. 2 X 50	<p>Material: Basic Concepts of Value Engineering Literature: <i>Soeharto, Iman. 2001. Project Management From Conceptual to Operational Volume 2. Jakarta: Erlangga Publishers.</i></p> <hr/> <p>Material: Basic Concepts of Value Engineering Literature: <i>Berawi, Mohammed Ali. 2014. Application of Value Engineering in the Building Construction Industry. Jakarta: University of Indonesia Publishers.</i></p>	10%

3	Understand the Basic Concepts of Value Engineering (Main Elements & Terms of Value Engineering).	Students can describe the Main Elements & Requirements of Value Engineering.	<p>Criteria: Good marks if questions are answered correctly.</p> <p>Form of Assessment : Participatory Activities</p>	Lectures, discussions and questions and answers. 2 X 50	Lectures and questions and answers. 2 X 50	<p>Material: Basic Concepts of Value Engineering Literature: <i>Soeharto, Iman. 2001. Project Management From Conceptual to Operational Volume 2. Jakarta: Erlangga Publishers.</i></p> <hr/> <p>Material: Basic Concepts of Value Engineering Literature: <i>Berawi, Mohammed Ali. 2014. Application of Value Engineering in the Building Construction Industry. Jakarta: University of Indonesia Publishers.</i></p>	5%
4	Understand the value engineering organizational structure.	Students can describe the organizational structure of value engineering.	<p>Criteria: Good marks if questions are answered correctly.</p> <p>Form of Assessment : Participatory Activities</p>	Lectures, discussions and questions and answers. 2 X 50	Lectures and questions and answers. 2 X 50	<p>Material: Value Engineering Organization Literature: <i>Soeharto, Iman. 2001. Project Management From Conceptual to Operational Volume 2. Jakarta: Erlangga Publishers.</i></p> <hr/> <p>Material: Value Engineering Organization Bibliography: <i>Berawi, Mohammed Ali. 2014. Application of Value Engineering in the Building Construction Industry. Jakarta: University of Indonesia Publishers.</i></p>	5%

5	Understand the implementation of value engineering at each stage of the project.	Students can explain the implementation of value engineering at each stage of the project.	<p>Criteria: Good marks if questions are answered correctly.</p> <p>Form of Assessment : Participatory Activities</p>	Lectures, discussions and questions and answers. 2 X 50	Lectures and questions and answers. 2 X 50	<p>Material: Stages of Value Engineering Literature: <i>Soeharto, Iman. 2001. Project Management From Conceptual to Operational Volume 2. Jakarta: Erlangga Publishers.</i></p> <hr/> <p>Material: Stages of Value Engineering Literature: <i>Berawi, Mohammed Ali. 2014. Application of Value Engineering in the Building Construction Industry. Jakarta: University of Indonesia Publishers.</i></p>	5%
6	Understand the concepts of value, cost, and function in value engineering.	Students can explain the concepts of value, cost, and function in value engineering and how they are related.	<p>Criteria: Good marks if questions are answered correctly.</p> <p>Form of Assessment : Project Results Assessment / Product Assessment</p>	Lectures, discussions and questions and answers. 2 X 50	Lectures and questions and answers. 2 X 50	<p>Material: Value, Cost, and Function Bibliography: <i>Berawi, Mohammed Ali. 2014. Application of Value Engineering in the Building Construction Industry. Jakarta: University of Indonesia Publishers.</i></p> <hr/> <p>Material: Value, Cost, and Function Reference: <i>Venkataraman Ray R., Pinto Jeffrey K. 2008. Cost and Value Management in Projects. New Jersey: John Wiley & Sons</i></p>	5%

7	Students understand the value engineering job plan.	<ol style="list-style-type: none"> 1.Students can state the reasons for needing a value engineering job plan. 2.Students can mention the stages of a value engineering job plan (value engineering job plan) 	<p>Criteria: Good marks if questions are answered correctly.</p> <p>Form of Assessment : Participatory Activities</p>	Lectures, discussions and questions and answers. 2 X 50	Lectures and questions and answers. 2 X 50	<p>Material: Value Engineering Work Plan Bibliography: <i>Berawi, Mohammed Ali. 2014. Application of Value Engineering in the Building Construction Industry. Jakarta: University of Indonesia Publishers.</i></p> <hr/> <p>Material: Value Engineering Work Plan Literature: <i>Soeharto, Iman. 2001. Project Management From Conceptual to Operational Volume 2. Jakarta: Erlangga Publishers.</i></p>	5%
8	Midterm Exam (UTS)						0%
9	Students can carry out the information phase value engineering work stages.	<ol style="list-style-type: none"> 1.Students can create building cost models. 2.Students can analyze the function of building components. 	<p>Criteria: Good marks if questions are answered correctly.</p> <p>Form of Assessment : Project Results Assessment / Product Assessment</p>	Lectures, discussions and questions and answers. 2 X 50	Lectures and questions and answers. 2 X 50	<p>Material: Value Engineering Work Plan Bibliography: <i>Berawi, Mohammed Ali. 2014. Application of Value Engineering in the Building Construction Industry. Jakarta: University of Indonesia Publishers.</i></p> <hr/> <p>Material: Value Engineering Work Plan Literature: <i>Soeharto, Iman. 2001. Project Management From Conceptual to Operational Volume 2. Jakarta: Erlangga Publishers.</i></p>	5%

10	Students can carry out the value engineering work stages, the speculation and analysis phases.	<ol style="list-style-type: none"> 1.Students can come up with creative ideas in the value engineering process. 2.Students can analyze the profits and losses of every creative idea that emerges. 	<p>Criteria: Good marks if questions are answered correctly.</p> <p>Form of Assessment : Project Results Assessment / Product Assessment</p>	Lectures, discussions and questions and answers. 2 X 50	Lectures and questions and answers. 2 X 50	<p>Material: Value Engineering Work Plan</p> <p>Bibliography: <i>Berawi, Mohammed Ali. 2014. Application of Value Engineering in the Building Construction Industry. Jakarta: University of Indonesia Publishers.</i></p> <hr/> <p>Material: Value Engineering Work Plan</p> <p>Literature: <i>Soeharto, Iman. 2001. Project Management From Conceptual to Operational Volume 2. Jakarta: Erlangga Publishers.</i></p>	10%
11	Students can carry out the value engineering work stages of the development phase.	<ol style="list-style-type: none"> 1.Students can apply the zero-one method to determine the weight of the required technical criteria. 2.Students can create an evaluation matrix. 	<p>Criteria: Good marks if questions are answered correctly.</p> <p>Form of Assessment : Project Results Assessment / Product Assessment</p>	Lectures, discussions and questions and answers. 2 X 50	Lectures and questions and answers. 2 X 50	<p>Material: Value Engineering Work Plan</p> <p>Bibliography: <i>Berawi, Mohammed Ali. 2014. Application of Value Engineering in the Building Construction Industry. Jakarta: University of Indonesia Publishers.</i></p> <hr/> <p>Material: Value Engineering Work Plan</p> <p>Literature: <i>Soeharto, Iman. 2001. Project Management From Conceptual to Operational Volume 2. Jakarta: Erlangga Publishers.</i></p>	10%

12	Students can carry out the value engineering work stages of the Recommendation Phase and Implementation Phase.	<ol style="list-style-type: none"> Students can apply the Recommendation Phase in value engineering. Students can apply the Implementation Phase in value engineering. 	<p>Criteria: Good marks if questions are answered correctly.</p> <p>Form of Assessment : Participatory Activities</p>	Lectures, questions and answers, practice questions. 2 X 50	Lectures, practice questions. 2 X 50	<p>Material: Value Engineering Work Plan</p> <p>Bibliography: Berawi, Mohammed Ali. 2014. <i>Application of Value Engineering in the Building Construction Industry</i>. Jakarta: University of Indonesia Publishers.</p> <hr/> <p>Material: Value Engineering Work Plan</p> <p>Literature: Soeharto, Iman. 2001. <i>Project Management From Conceptual to Operational Volume 2</i>. Jakarta: Erlangga Publishers.</p>	5%
13	Students can carry out value engineering for building projects.	Students can apply and present value engineering job plans on building construction projects.	<p>Criteria: Good marks if the presentation and questions can be answered well and correctly.</p> <p>Form of Assessment : Project Results Assessment / Product Assessment</p>	Presentations and group discussions. 2 X 50	Presentations and group discussions. 2 X 50	<p>Material: Value Engineering Work Plan</p> <p>Bibliography: Berawi, Mohammed Ali. 2014. <i>Application of Value Engineering in the Building Construction Industry</i>. Jakarta: University of Indonesia Publishers.</p> <hr/> <p>Material: Value Engineering Work Plan</p> <p>Literature: Soeharto, Iman. 2001. <i>Project Management From Conceptual to Operational Volume 2</i>. Jakarta: Erlangga Publishers.</p> <hr/> <p>Material: Value Engineering Job Plan</p> <p>Bibliography: Dell 19isola Alphonse J. 1982. <i>Value Engineering in the Construction Industry, 3rd Edition</i>. New York: Van Nostrand Reinhold.</p>	10%

14	Students can carry out value engineering for road and bridge projects.	Students can apply and present value engineering job plans on road and bridge projects.	<p>Criteria: Good marks if the presentation and questions can be answered well and correctly.</p> <p>Form of Assessment : Project Results Assessment / Product Assessment</p>	Presentations and group discussions. 2 X 50	Presentations and group discussions. 2 X 50	<p>Material: Value Engineering Work Plan</p> <p>Bibliography: <i>Berawi, Mohammed Ali. 2014. Application of Value Engineering in the Building Construction Industry. Jakarta: University of Indonesia Publishers.</i></p> <p>Material: Value Engineering Work Plan</p> <p>Literature: <i>Soeharto, Iman. 2001. Project Management From Conceptual to Operational Volume 2. Jakarta: Erlangga Publishers.</i></p> <p>Material: Value Engineering Job Plan</p> <p>Bibliography: <i>Dell 19isola Alphonse J. 1982. Value Engineering in the Construction Industry, 3rd Edition. New York: Van Nostrand Reinhold.</i></p>	10%
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15	Students can carry out value engineering for water building projects.	Students can apply and present a value engineering job plan on a water building project.	<p>Criteria: Good marks if the presentation and questions can be answered well and correctly.</p> <p>Form of Assessment : Project Results Assessment / Product Assessment</p>	Presentations and group discussions. 2 X 50	Presentations and group discussions. 2 X 50	<p>Material: Value Engineering Work Plan</p> <p>Bibliography: Berawi, Mohammed Ali. 2014. <i>Application of Value Engineering in the Building Construction Industry</i>. Jakarta: University of Indonesia Publishers.</p> <p>Material: Value Engineering Work Plan</p> <p>Literature: Soeharto, Iman. 2001. <i>Project Management From Conceptual to Operational Volume 2</i>. Jakarta: Erlangga Publishers.</p> <p>Material: Value Engineering Job Plan</p> <p>Bibliography: Dell 19isola Alphonse J. 1982. <i>Value Engineering in the Construction Industry, 3rd Edition</i>. New York: Van Nostrand Reinhold.</p>	10%
16	Final Semester Examination (UAS)						0%

Evaluation Percentage Recap: Project Based Learning

No	Evaluation	Percentage
1.	Participatory Activities	40%
2.	Project Results Assessment / Product Assessment	60%
		100%

Notes

- 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.
- 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.
- 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.
- 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.
- Indicators for assessing** abilities in the process and student learning outcomes are specific and measurable statements that identify the abilities or performance of student learning outcomes accompanied by evidence.
- 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.
- Forms of assessment:** test and non-test.
- 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.
- 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.
- 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.