

		Universitas Negeri Surabaya Vocational Faculty, D4 Civil Engineering Study Program					Document Code																																										
SEMESTER LEARNING PLAN																																																	
Courses		CODE	Course Family	Credit Weight			SEMESTER	Compilation Date																																									
STRUCTURAL ANALYSIS OF THE MATRIX METHOD		2230502026		T=2	P=0	ECTS=3.18	4	July 17, 2024																																									
AUTHORIZATION		SP Developer		Course Cluster Coordinator			Study Program Coordinator																																										
				Puguh Novi Prasetyono, S.Pd., M.T.																																										
Learning model	Case Studies																																																
Program Learning Outcomes (PLO)	PLO study program which is charged to the course																																																
	Program Objectives (PO)																																																
	PLO-PO Matrix																																																
		<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="width: 100px; height: 30px;"></td> <td colspan="16" style="text-align: center;">P.O</td> </tr> </table>								P.O																																							
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	PO Matrix at the end of each learning stage (Sub-PO)																																																
	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td rowspan="2" style="width: 50px; height: 30px;"></td> <td colspan="16" style="text-align: center;">Week</td> </tr> <tr> <td style="width: 20px; text-align: center;">1</td> <td style="width: 20px; text-align: center;">2</td> <td style="width: 20px; text-align: center;">3</td> <td style="width: 20px; text-align: center;">4</td> <td style="width: 20px; text-align: center;">5</td> <td style="width: 20px; text-align: center;">6</td> <td style="width: 20px; text-align: center;">7</td> <td style="width: 20px; text-align: center;">8</td> <td style="width: 20px; text-align: center;">9</td> <td style="width: 20px; text-align: center;">10</td> <td style="width: 20px; text-align: center;">11</td> <td style="width: 20px; text-align: center;">12</td> <td style="width: 20px; text-align: center;">13</td> <td style="width: 20px; text-align: center;">14</td> <td style="width: 20px; text-align: center;">15</td> <td style="width: 20px; text-align: center;">16</td> </tr> </table>																	Week																1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
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Short Course Description	Understanding Structure, Structural Analysis Methods, Role of Matrix Algebra and Computation in Structural Analysis; Style Methods: Method Elaboration, Flexibility Matrix, Static Matrix; Application of Force Method: Support Reaction of Continuous Beam Structures, Certain Static Plane Truss Structures. Displacement Method: Method Description, Bar Stiffness Matrix, Global Stiffness Matrix, Global Equation. Learning is carried out using the Direct Learning Method (MPL) and ends with discussion activities.																																																
References	Main :																																																
	1. [1]. Sunggono. 1984. Buku Teknik Sipil. Jakarta: Penerbit Nova. [2]. Wang, Chu-Kia. 1985. Pengantar Analisis Struktur dengan Cara Matriks, Ismoyo Penerjemah. Jakarta : Erlangga. [3]. Sabariman, Bambang. 2015. Analisis Struktur Metode Matriks. Surabaya: JTS FT Unesa. [4]. Sabariman, Bambang & Dani, Hasan. 2015. Pemanfaatan Gambar Gaya Lintang dalam Perhitungan Momen Statis Tertentu, Jurnal JKPTB Vol.01 No.01 2015 ISSN 1271-2012, hal 142-147. [5]. Szilard, Rudolph. 1989. Teori dan Analisis Pelat Metode Klasik dan Numerik, Wira Penerjemah. Jakarta : Erlangga. [6]. Kho Hong Geh. 1989. Singkat Tepat Jelas MathCad Menyelesaikan Problem Numerik dan Matematika. Jakarta: PT. Elex Media Komputindo. [7]. Jurnal JPTK Unesa. 2015.																																																
	Supporters:																																																
Supporting lecturer	Dr. Suprpto, S.Pd., M.T. Ir. Fransiskus Xaverius Maradona Manteiro, S.T., M.Sc. Anggi Rahmad Zulfikar, M.T. Berkat Cipta Zega, S.Pd., M.Eng.																																																
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	Able to understand the use of matrices in statically indeterminate structures	Explain the difference between a statically certain structure (ST) and a statically indeterminate structure (STT).		Lectures, discussions and questions and answers 2 X 50			0%
2	Able to understand the concept of structural analysis matrix method (ASMM).	Explains the concept of structural analysis matrix method (ASMM).		Lectures, discussions, questions and answers and practice discussion of STT 2 X 50 beam questions			0%
3	Able to form STT beam matrix	Explains matrix formation and analysis of STT beams		Lectures, questions and answers and practice discussing the STT 2 X 50 beam			0%
4	Able to form a simple STT beam matrix	Explains matrix formation and analysis of simple STT beams		Lectures, discussions, questions and answers and practice discussing STT 2 X 50 simple beam problems			0%
5	Capable of forming STT continuous beam matrices	Explains matrix formation and analysis of STT continuous beams		Lectures, discussions, questions and answers and practice discussion of STT 2 X 50 continuous beam problems			0%
6	Capable of forming STT continuous beam matrices	Explains matrix formation and analysis of STT continuous beams		Lectures, discussions, questions and answers and practice discussion of STT 2 X 50 continuous beam problems			0%
7	Able to form a fixed portal matrix	Explains matrix formation and fixed portal analysis		Lectures, discussions, questions and answers and fixed portal exercises Task 1. 2 X 50			0%

8	Able to form a fixed portal matrix	Explains matrix formation and fixed portal analysis		Lectures, discussions, questions and answers and fixed portal exercises Task 1. 2 X 50			0%
9	UTS			2 X 50			0%
10	Able to form a swaying portal matrix	Explains matrix formation and sway portal analysis		Lectures, discussions, questions and answers and 2 X 50 swaying portal exercises			0%
11	Able to form a swaying portal matrix	Explains matrix formation and sway portal analysis		Lectures, discussions, questions and answers and 2 X 50 swaying portal exercises			0%
12	Able to form a beam matrix using the Finite Different (FD) Method	Explaining matrix formation and beam analysis Finite Different (FD) Method		Lectures, discussions, questions and answers and 2 X 50 block practice			0%
13	Able to form a beam matrix using the Finite Different (FD) Method	Explaining matrix formation and beam analysis Finite Different (FD) Method		Lectures, discussions, questions and answers and 2 X 50 block practice			0%
14	Able to form Finite Different (FD) Method plate matrix	Explains matrix formation and FD Method plate analysis		Lectures, discussions, questions and answers and 2 X 50 block practice			0%
15	Able to form a support plate matrix using a combination of the FD Method	Explains matrix formation and analysis of support plates using the FD Method combination.		Lectures, discussions, questions and answers and block exercises Task 2. 2 X 50			0%
16	UAS		Forms of Assessment : Participatory Activities, Project Results Assessment / Product Assessment, Tests				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** 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.
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.