| | **Universitas Negeri Surabaya**
Vocational Faculty,
D4 Transportation Study Program | |

SEMESTER LEARNING PLAN

Courses		**CODE**		**Course Family**		**Credit Weight**			**SEMESTER**	**Compilation Date**
Concrete Structures		99993940102032				T=2	P=0	ECTS=3.18	2	July 16, 2024

AUTHORIZATION		**SP Developer**		**Course Cluster Coordinator**		**Study Program Coordinator**
		....		....		Dr. Anita Susanti, S.Pd., M.T.

Learning model	**Project Based Learning**
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	Basic assumptions for calculating reinforced concrete, load and load factors, analysis and methods for designing rectangular sections in terms of ultimate strength. Calculation of cantilever plates, one-way plates, two-way plates, plates with line loads and deflection control and crack width control. Calculation of two-support beams, calculation of stairs, T beams, double rib beams and deflection control, and distribution lengths, shear and torsion calculations. Calculation of short consoles, basics of calculating column strength, braced and unbraced frames, safety provisions, short columns with small and large eccentricities, slender columns, percentage of reinforcement, round columns, beam and column connections, palm foundations, continuous slab foundations, full slab foundations and deep foundation.

References	**Main :**	
	1. Departemen PU. 2013. Persyaratan Beton Struktural untuk Bangunan Gedung SNI 2847. BSN Bandung LPMB. 2. Gideon Kusuma.1993. Dasar-dasar Perencanaan Beton Bertulang berdasarkan SKSNI. Jakarta: Erlangga. 3. Edward G Nawy. 2009. Reinforced Concrete A Fundamental Approach. New York: Prentice Hall. 4. Jack C. Mc. Cormac. 2013. Design of Reinforced Concrete. Russel H Brown. 5. ACI Journal. 2015. ACI Structural Journal American Concrete Institute.	
	Supporters:	

Supporting lecturer	Arie Wardhono, S.T., M.MT., M.T., Ph.D. Purwo Mahardi, S.T., M.Sc.

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 explain how to derive formulas for rectangular design of reinforcement		Explain the basic assumptions for calculating rectangular cross-sections	**Criteria:** Can plan plate thickness correctly (score 50). Can draw correctly (score 50)	Lectures, discussions and questions and answers, 4 X 50 exercises			0%

2	Able to plan cantilever plate reinforcement & one-way plates	Explains Limit Strength planning and can calculate reinforcement for cantilever plates & one-way plates	**Criteria:** 1. Can plan plate thickness correctly (score 50). 2. Can draw correctly (score 50)	Lectures, discussions and questions and answers. Exercise 1 X 1			0%
3	Able to plan two-way slab reinforcement and line load slabs	Explains how to calculate two-way plates & line load plates	**Criteria:** 1. Can plan plate thickness correctly (score 50). 2. Can draw correctly (score 50)	Lectures, discussions and questions and answers. Exercise 1 X 1			0%
4	Able to apply deflection control and crack width control	Explain how to apply deflection control and crack width	**Criteria:** 1. Can plan plate thickness correctly (score 50). 2. Can draw correctly (score 50)	Lectures, discussions and questions and answers. Exercise 1 X 1			0%
5	Able to calculate the reinforcement of single reinforced beams and their shear reinforcement. Able to calculate the reinforcement of T beams	Explains how to calculate a double-supported beam and its shear reinforcement. Explains how to calculate the reinforcement for a T beam	**Criteria:** 1. Can plan single reinforced beams and T beams correctly (score 50). 2. Can draw correctly (score 50)	Lectures, discussions and questions and answers. Exercise 1 X 1			0%
6	Able to calculate the reinforcement of single reinforced beams and their shear reinforcement. Able to calculate the reinforcement of T beams	Explains how to calculate a double-supported beam and its shear reinforcement. Explains how to calculate the reinforcement for a T beam	**Criteria:** 1. Can plan single reinforced beams and T beams correctly (score 50). 2. Can draw correctly (score 50) **Form of Assessment** : Participatory Activities	Lectures, discussions and questions and answers. Exercise 1 X 1			0%
7	Able to calculate the reinforcement of Double Bone beams	Explains how to calculate the reinforcement for Double Bone beams	**Criteria:** Can plan double reinforcement beams correctly	Lectures, discussions and questions and answers. Exercise 1 X 1			0%
8	Able to calculate the reinforcement of Double Bone beams	Explains how to calculate the reinforcement for Double Bone beams	**Criteria:** Can plan double reinforcement beams correctly	Lectures, discussions and questions and answers. Exercise 1 X 1			0%
9	Able to plan torsion shear beams Able to plan short consoles	Explaining the ultimate strength planning regarding torsion shear beams. Explaining the planning of short consoles	**Criteria:** 1. Can plan reinforcement for torsion shear beams and short consoles correctly (score 50). 2. Can draw correctly (score 50)	Lectures, discussions and questions and answers. Exercise 1 X 1			0%
10							0%
11	Able to plan ordinary columns and columns using stiffeners. Able to plan short columns with small and large eccentricities	Explains the planning of ordinary columns and columns using stiffeners. Explains the planning of short columns with small and large eccentricities	**Criteria:** Can plan columns correctly (score 100).	Lectures, discussions and questions and answers. Exercise 1 X 1			0%
12							0%

13	Able to plan slim columns Able to plan round columns	Explaining the planning of slender columns Explaining the planning of round columns	**Criteria:** Can plan columns correctly (score 100).	Lectures, discussions and questions and answers. Exercise 1 X 1			0%
14							0%
15	Able to plan beam-column connections Able to plan local, continuous, full plate and foundation calculations	Explains the planning of beam-column connections. Explains the calculations for local, continuous, full plate and deep foundations	**Criteria:** 1. Report on planning results 2. (score 60) 3. Report presentation (score 40)	Lectures, discussions and questions and answers. Exercise 1 X 1			0%
16							0%

Evaluation Percentage Recap: Project Based Learning

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.