	Universitas Negeri Surabaya Vocational Faculty, D4 Civil Engineering Study Program	Document Code

SEMESTER LEARNING PLAN

Courses	CODE	Course Family	Credit Weight			SEMESTER	Compilation Date
Building structure	99992240102011	Structure	T=2	P=0	ECTS=3.18	1	July 17, 2024

AUTHORIZATION	SP Developer	Course Cluster Coordinator	Study Program Coordinator
	Feriza Nadiar, S.T., M.T.	.....	Puguh Novi Prasetyono, S.Pd., M.T.

Learning model	**Project Based Learning**	
Program Learning Outcomes (PLO)	**PLO study program which is charged to the course**	
	Program Objectives (PO)	
	PO - 1	Utilizing learning resources and ICT to support mastery of construction theory for low-rise and non-storied buildings which include roof shapes, roof construction, gable roofs, shield roofs, wall shapes and brick ties, wood connections, doors and windows, direct foundations and foundations indirect, column beams, stairs, ceilings and floors.
	PO - 2	Have knowledge of mastering the construction theory of low-rise buildings and non-storied buildings which includes roof shapes, roof construction, gable roofs, shield roofs, wall shapes and brick ties, wood connections, doors and windows, direct foundations and indirect foundations, beams columns, stairs, ceilings and floors in accordance with established quality standards.
	PO - 3	Make decisions in designing the construction of low-rise buildings and non-storied buildings which include roof shapes, roof construction, gable roofs, shield roofs, wall shapes and brick ties, wood connections, doors and windows, direct foundations and indirect foundations, column beams , stairs, ceilings and floors professionally.
	PO - 4	Have a responsible attitude by implementing mastery of low-rise and non-storied building construction which includes roof shapes, roof construction, gable roofs, shield roofs, wall shapes and brick ties, wood connections, doors and windows, direct foundations and indirect foundations , column beams, stairs, ceilings and floors professionally.
	PLO-PO Matrix	

P.O
PO-1
PO-2
PO-3
PO-4

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
PO-1																
PO-2																
PO-3																
PO-4																

Short Course Description	This course provides understanding and mastery of the construction of low-rise and non-storied buildings which includes roof shapes, roof construction, gable roofs, shield roofs, wall shapes and brick ties, wood connections, doors and windows, direct foundations and indirect foundations. , column beams, stairs, ceilings and floors. Students' ability to apply theory in the form of working drawings (graphics) is a very important supporting element in this course. Lectures are held through an expository approach in the form of lectures and questions and answers followed by discussion and reflection activities which are equipped with the use of LCD, OHP, and an inquiry approach, namely partial/structured completion of individual assignments.
References	**Main :**

	1. A. Pill, Ringkasan Ilmu Bangunan bagian a, 1983 2. A. Pill, Ringkasan Ilmu Bangunan bagian b, 1983 3. Hendardji Bangunan Umum Jilid A. 4. IGN Benny Puspantoro, M.Sc, Konstruksi Bangunan Gedung Tidak Bertingkat. 5. IGN Benny Puspantoro, M.Sc, Konstruksi Bangunan Gedung Bertingkat. 6. Imam Subarkah, Konstruksi Bangunan Gedung.
	Supporters:
Supporting lecturer	Arik Triarso, S.Pd., M.T. Feriza Nadiar, S.T., 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	Understanding roof shapes Designing roof shapes	1.Students are able to: Explain the shapes of roofs 2.Design the roof shape	**Criteria:** The answer is perfect if answered well and correctly **Form of Assessment** : Participatory Activities		Lecture, Question and Answer, Discussion 2 x 50 minutes	**Material:** roof shape **Reference:** *A. Pill, Summary of Building Science part a, 1983* **Material:** roof shape **Reference:** *A. Pill, Summary of Building Science part b, 1983* **Material:** buildings in general **Reference:** *Hendardji Public Buildings Volume A.* **Material:** Roofs on non-storied buildings **Reference:** *IGN Benny Puspantoro, M.Sc, Construction of Non-Storied Buildings.* **Material:** Roofs on multi-storey buildings **Reference:** *IGN Benny Puspantoro, M.Sc, Construction of multi-storey buildings.*	4%

2	Understanding the construction of the truss, designing the position of the truss	1. Students are able to: Explain the construction of the truss 2. Design the position of the horses	**Criteria:** The answer is perfect if answered well and correctly **Form of Assessment** : Participatory Activities		Lecture, Question and Answer, Discussion 2 x 50 minutes	**Material:** Truss construction **Reference:** *A. Pill, Summary of Building Science part a, 1983* **Material:** Truss construction **Reference:** *A. Pill, Summary of Building Science part b, 1983* **Material:** Buildings in general **Reference:** *Hendardji Public Buildings Volume A.* **Material:** trusses in non-storied buildings **Reference:** *IGN Benny Puspantoro, M.Sc, Construction of Non-Storied Buildings.* **Material:** trusses in multi-storey buildings **Reference:** *IGN Benny Puspantoro, M.Sc, Construction of Multi-Storey Buildings.*	4%

3	Understanding gable roof constructionDesigning gable roof construction	1. Students are able to: Explain the construction of a gable roof 2. Design gable roof construction	**Criteria:** The answer is perfect if answered well and correctly **Form of Assessment** : Participatory Activities	Lecture, Question and Answer, Discussion, Drawing Workshop 2 x 50 minutes		**Material:** Gable roof **Reference:** *A. Pill, Summary of Building Science part a, 1983* **Material:** Gable roof **Reference:** *A. Pill, Summary of Building Science part b, 1983* **Material:** buildings in general **Reference:** *Hendardji Public Buildings Volume A.* **Material:** Gable roofs on non-storied buildings **Reference:** *IGN Benny Puspantoro, M.Sc, Construction of Non-Storey Buildings.* **Material:** Gable roofs on multi-storey buildings **Reference:** *IGN Benny Puspantoro, M.Sc, Construction of multi-storey buildings.*	4%

4	Understanding shield roof construction Designing shield roof construction	1. Students are able to: Explain the construction of a shield roof 2. Designing shield roof construction	**Criteria:** The answer is perfect if answered well and correctly **Form of Assessment** : Participatory Activities	Lecture, Question and Answer, Discussion, Drawing Workshop 2 x 50 minutes		**Material:** Shield roof **Reference:** *A. Pill, Summary of Building Science part a, 1983* **Material:** Shield roof **Reference:** *A. Pill, Summary of Building Science part b, 1983* **Material:** Buildings in general **Reference:** *Hendardji Public Buildings Volume A.* **Material:** Shield roofs on non-storied buildings **Reference:** *IGN Benny Puspantoro, M.Sc, Construction of Non-Storied Buildings.* **Material:** Shield roofs on multi-storey buildings **Reference:** *IGN Benny Puspantoro, M.Sc, Construction of multi-storey buildings.*	4%

5	Students are able to: Explain the shapes of walls. Explain the conditions for bonding bricks. Quiz	1. Wall shapes 2. Conditions for bonding bricks 3. Quiz	**Criteria:** The answer is perfect if answered well and correctly **Form of Assessment** : Participatory Activities, Tests	Lecture, Question and Answer, Discussion 2 x 50 minutes		**Material:** Library Wall **:** *A. Pill, Summary of Building Science part a, 1983* **Material:** Library Wall **:** *A. Pill, Summary of Building Science part b, 1983* **Material:** Buildings in general **Reference:** *Hendardji Public Buildings Volume A.* **Material:** Walls in non-storied buildings **Reference:** *IGN Benny Puspantoro, M.Sc, Construction of Non-Storied Buildings.* **Material:** Walls in multi-storey buildings **Reference:** *IGN Benny Puspantoro, M.Sc, Construction of multi-storey buildings.*	4%

6	Understanding the terms of wood connectionsUnderstanding the various types of wood connectionsUnderstanding wood joints in longitudinal, corner, wide and pole directionsUnderstanding the meaning, function, types of ceiling materials	1. Students are able to: Explain the requirements for wood connections 2. Explain the various types of wood joints 3. Explains wood joints in longitudinal, angled, wide and pole directions 4. Explain the meaning, function, types of ceiling materials	**Criteria:** The answer is perfect if answered well and correctly **Form of Assessment** : Participatory Activities, Tests	Lecture, Question and Answer, Discussion, Drawing Workshop 2 x 50 minutes		**Material:** Wood connections **Reference:** *A. Pill, Summary of Building Science part a, 1983* **Material:** Wood connections **Reference:** *A. Pill, Summary of Building Science part b, 1983* **Material:** Buildings in general **Reference:** *Hendardji Public Buildings Volume A.* **Material:** Wooden connections in non-storied buildings **Reference:** *IGN Benny Puspantoro, M.Sc, Construction of Non-Storey Buildings.* **Material:** Wooden connections in multi-storey buildings **Reference:** *IGN Benny Puspantoro, M.Sc, Construction of multi-storey buildings.*	5%
7	Understand the meaning of various types of foundations for non-storied buildingsUnderstand the meaning of various floor coverings for non-storied buildingsDesign foundations for non-storied buildings	1. Students are able to: Explain the meaning of the various types of foundations for non-storied buildings 2. Explain the meaning of various floor coverings for non-storey buildings 3. Designing foundations for non-storied buildings	**Criteria:** The answer is perfect if answered well and correctly **Forms of Assessment** : Participatory Activities, Practice/Performance, Tests	Lectures, Questions and Answers, Discussions, 2 X 50 Drawing Workshop			5%
8	Knowing the materials of door and window framesKnowing the various types of doors and windowsKnowing the various types of hanging and locking devicesDrawing door and window frames		**Criteria:** The answer is perfect if answered well and correctly **Form of Assessment** : Test	2 X 50			15%

9	Know the various types of hanging and locking toolsQuiz	1. Students are able to: Name various types of hanging and locking tools 2. Quiz	**Criteria:** The answer is perfect if answered well and correctly **Form of Assessment** : Participatory Activities, Tests	Lectures, Questions and Answers, Discussions, 2 X 50 Drawing Workshop		**Material:** Mention the various types of hanging and locking devices **Reference:** *A. Pill, Summary of Building Science part a, 1983* **Material:** Mention various types of hanging and locking devices **Reference:** *A. Pill, Summary of Building Science part b, 1983* **Material:** Mentions various types of hanging and locking tools **. Reference:** *IGN Benny Puspantoro, M.Sc, Non-Storey Building Construction.* **Material:** Mentions various types of hanging and locking tools. **Reference:** *Imam Subarkah, Building Construction.*	4%
10	1. Understand the various types of foundations 2. Understand direct and indirect foundations 3. Apply a direct or indirect foundation that is suitable for use	1. Students are able to: Understand the various types of foundations 2. Understand direct and indirect foundations 3. Determine the appropriate direct or indirect foundation to use	**Criteria:** The answer is perfect if answered well and correctly **Form of Assessment** : Participatory Activities	Lecture, Question and Answer, Discussion 2 X 50		**Material:** Direct and indirect foundations **Reference:** *IGN Benny Puspantoro, M.Sc, Non-Storey Building Construction.* **Material:** Determining direct or indirect foundations that are suitable for use. **Reference:** *IGN Benny Puspantoro, M.Sc, Construction of Multi-Storey Buildings.*	4%

11	1. Understand the meaning of beams and columns 2. Understand the layout and function of column beams 3. Design structural columns or practical columns 4. Determine the main beam or child beam	1. Students are able to: Explain the meaning of beams and columns 2. Determine the layout and function of column beams 3. Drawing structural columns or practical columns 4. Determine the main beam or child beam	**Criteria:** The answer is perfect if answered well and correctly **Form of Assessment** : Participatory Activities	Lecture, Question and Answer, Discussion 2 X 50		**Material:** Explaining the meaning of beams and columns **References:** *A. Pill, Summary of Building Science part b, 1983* **Material:** Determining the layout and function of column beams **Reference:** *Imam Subarkah, Building Construction.* **Material:** Drawing structural columns or practical columns **Reference:** *IGN Benny Puspantoro, M.Sc, Construction of Multi-Storey Buildings.* **Material:** Determining main beams or child beams **Reference:** *IGN Benny Puspantoro, M.Sc, Construction of Multi-Storey Buildings.*	4%
12	1. Know the various types of stairs 2. Apply the shape and location of the stairs	1. Students are able to: Explain the various types of stairs 2. Determine the shape and location of the stairs	**Criteria:** The answer is perfect if answered well and correctly **Form of Assessment** : Test	Lecture, Question and Answer, Discussion 2 X 50		**Material:** Explains the various shapes and types of stairs. **Reference:** *Hendardji Public Buildings Volume A.* **Material:** Determining the shape and location of stairs **Reference:** *IGN Benny Puspantoro, M.Sc, Construction of Multi-Storey Buildings.*	4%
13	1. Know the function of stairs 2. Designing stair construction	1. Students are able to: Explain the function of stairs 2. Designing stair construction 3. Quiz	**Criteria:** The answer is perfect if answered well and correctly **Form of Assessment** : Test	Lecture, Question and Answer, Discussion 2 X 50		**Material:** Function of stairs **Reference:** *Hendardji Public Buildings Volume A.* **Material:** Stair construction **Reference:** *Imam Subarkah, Building Construction.*	4%

14	1. Know the shape of a steel roof 2. Understanding steel roof construction 3. Designing steel roof construction	1. Students are able to: Explain the shape of a steel roof 2. Explain steel roof construction 3. Designing steel roof construction	**Criteria:** The answer is perfect if answered well and correctly **Form of Assessment** : Participatory Activities, Practical Assessment	Lectures, Questions and Answers, Discussions, 2 X 50 Drawing Workshop		**Material:** Shapes of steel roofs **Reference:** *Hendardji Public Buildings Volume A.* **Material:** Steel roof construction **Reference:** *Imam Subarkah, Building Construction.* **Material:** Steel roof construction design **Reference:** *IGN Benny Puspantoro, M.Sc, Construction of Multi-Storey Buildings.*	5%
15	Group exercises and assignments	1. Gable roof construction tasks 2. Shield roof construction tasks 3. Door and window frame duties 4. The task of building foundations is not multi-storey 5. The task of building foundations is not multi-storey 6. Ladder duty 7. Steel roofing tasks 8. Big mission	**Criteria:** The answer is perfect if answered well and correctly **Form of Assessment** : Practical Assessment	Lectures, Questions and Answers, Discussions, 2 X 50 Drawing Workshop		**Material:** gable roof construction **Reference:** *Hendardji Public Buildings Volume A.* **Material:** shield roof construction **Reference:** *Hendardji Public Buildings Volume A.* **Material:** door and window frames **Reference:** *A. Pill, Summary of Building Science part a, 1983* **Material:** foundations of non-storied buildings **Reference:** *IGN Benny Puspantoro, M.Sc, Construction of Non-Storied Buildings.* **Material:** Stairs **Library:** *IGN Benny Puspantoro, M.Sc, Construction of Multi-Storey Buildings.* **Material:** Steel roof **Reference:** *IGN Benny Puspantoro, M.Sc, Construction of Multi-Storey Buildings.*	10%

16			**Form of Assessment** : Test	2 X 50 Minutes			20%

Evaluation Percentage Recap: Project Based Learning

No	Evaluation	Percentage
1.	Participatory Activities	34.67%
2.	Practical Assessment	12.5%
3.	Practice / Performance	1.67%
4.	Test	51.17%
		100%

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.