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

SEMESTER LEARNING PLAN

Courses	CODE	Course Family	Credit Weight			SEMESTER	Compilation Date
PRESPRESSED CONCRETE STRUCTURES	2230502029		T=2	P=0	ECTS=3.18	5	July 17, 2024

AUTHORIZATION	SP Developer	Course Cluster Coordinator	Study Program Coordinator
	.....	.....	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)
	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	Understanding and initial ideas about prestressed concrete, how to provide steel prestressing forces (pretensioning & posttensioning), prestressing concrete and steel materials, basic principles of planning and analyzing cross-sections (elastic conditions, steel-concrete cooperation, load balancing), casting and cable pulling processes, loss prestressing forces (shrinkage, creep, relaxation, due to slippage, friction, influence of length), cross-section planning and stress calculations for concrete sections, casting and running cables, shear stresses, danger situation diagrams for prestressed concrete, anchorage in posttensioning systems, transverse tensile stresses at the final block of the limit moment. Learning is carried out using the Direct Learning Method (MPL) and ends with discussion activities.
References	**Main :**

1. T Y Lin. 2000. Desain Struktur Beton Prategan Jilid 1 . Mediana Penterjemah. Jakarta: Bina Rupa Aksara.
2. Naaman E Antonie. 1982. Prestressed Concrete Analysis and Design Fundamental . New York: McGraw-Hill.
3. Nawy Edward G. 2001. Beton Prategang Suatu Pendekatan Mendasar Jilid 1 Edisi III . Bambang Suryoatmono Penterjemah. Jakarta: Erlangga.
4. Raju Krishna. 1989. Beton Prategang Edisi Kedua . Yani Sianipar Editor. Jakarta: Erlangga.

Supporters:	
Supporting lecturer	Dr. Suprapto, 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 prestressed concrete structures	Explain the basic principles/concepts of prestressed concrete, the differences between conventional concrete and statically certain (ST) and statically indeterminate (STT) prestressed concrete.	**Criteria:** Score 20 if the explanation of the concept of prestressed concrete is correct Score 20 if the explanation of conventional concrete is correct Score 20 if the explanation of the concept of prestressed concrete is correct Score 20 if the explanation of the concept of ST prestressed concrete structures is correct Score 20 if the explanation of the concept of ST prestressed concrete structures is correct	MPL question and answer discussion lecture. 2 X 50			0%
2	Able to understand the use of prestressed concrete materials	Explain prestressed concrete materials.	**Criteria:** Score 40 if the explanation about the properties of high quality steel & properties of high quality prestressed concrete is correct. Score 60 if the explanation about the properties of creep & shrinkage of conduit fatigue strength is correct.	MPL question and answer discussion lecture. 4 X 50			0%
3							0%
4	Able to analyze the behavior of prestressed concrete	Explain the analysis of prestressed concrete behavior.	**Criteria:** Score 50 if the explanation about pre-tensioning is correct. Score 50 if the explanation about post-tensioning is correct.	MPL question and answer discussion lecture. 4 X 50			0%
5							0%
6	Able to analyze the loss of prestressed concrete force, final stress, cracking moment & ultimate moment	Explains the analysis of force loss in prestressed concrete, final stress, cracking moment & ultimate moment.	**Criteria:** Score 45 if the calculation of the total loss of prestress force is correct. Score 10 if the final stress calculation is correct. Score 15 if Mr‘s calculation is correct. Score 20 if Mu‘s calculation is correct. Score 10 if the stress sketch is correct.	MPL question and answer discussion lecture. Task 1 4 X 50			0%
7							0%
8	UTS	Able to analyze the loss of final stress prestress force Mr & Mu.	**Criteria:** Score 45 if the calculation of the total loss of prestress force is correct. Score 10 if the final stress calculation is correct. Score 15 if Mr‘s calculation is correct. Score 20 if Mu‘s calculation is correct. Score 10 if the stress sketch is correct.	Written exam and collect assignments 1. 2 X 50			0%

9	Able to analyze the loss of prestressed concrete force, final stress, cracking moment & ultimate moment	Explains the analysis of force loss in prestressed concrete, final stress, cracking moment & ultimate moment.	**Criteria:** Score 40 if the total prestress force loss calculation is correct. Score 10 if the final stress calculation is correct. Score 15 if the Mr calculation is correct. Score 15 if the Mu calculation is correct. Score 10 if the deflection calculation is correct. Score 10 if the stress sketch is correct.	MPL question and answer discussion lecture. 4 X 50			0%
10							0%
11	Able to analyze the loss of prestressed concrete force, final stress, cracking moment & ultimate moment	Explains the analysis of force loss in prestressed concrete, final stress, cracking moment & ultimate moment.	**Criteria:** Score 40 if the total prestress force loss calculation is correct. Score 10 if the final stress calculation is correct. Score 15 if the Mr calculation is correct. Score 15 if the Mu calculation is correct. Score 10 if the deflection calculation is correct. Score 10 if the stress sketch is correct.	MPL question and answer discussion lecture. 2 X 50			0%
12	Able to analyze the loss of prestressed concrete force, final stress, cracking moment & ultimate moment	Explains the analysis of force loss in prestressed concrete, final stress, cracking moment & ultimate moment.	**Criteria:** Score 40 if the total prestress force loss calculation is correct. Score 10 if the final stress calculation is correct. Score 15 if the Mr calculation is correct. Score 15 if the Mu calculation is correct. Score 10 if the deflection calculation is correct. Score 10 if the stress sketch is correct.	MPL question and answer discussion lecture. 2 X 50			0%
13	Able to analyze the loss of prestressed concrete force, final stress, cracking moment & ultimate moment	Explains the analysis of force loss in prestressed concrete, final stress, cracking moment & ultimate moment.	**Criteria:** Score 70 if the Cross moment and analysis of the influence of prestress forces are correct. Score 15 if the CgNb calculation is correct. Score 15 if the hyperstatic reaction calculation is correct	MPL question and answer discussion lecture. 2 X 50			0%
14	Able to analyze the loss of prestressed concrete force, final stress, cracking moment & ultimate moment	Explains the analysis of force loss in prestressed concrete, final stress, cracking moment & ultimate moment.	**Criteria:** Score 70 if the Cross moment and analysis of the influence of prestress forces are correct. Score 15 if the CgNb calculation is correct. Score 15 if the hyperstatic reaction calculation is correct	MPL question and answer discussion lecture. 2 X 50			0%
15	Able to analyze end block stress and stirrup requirement analysis.	Explains end block stress analysis and stirrup requirement analysis.	**Criteria:** Score 45 if the end block stress calculation is correct. Score 45 if the stirrup requirement calculation is correct. Score 10 if the stirrup reinforcement sketch is correct.	MPL question and answer discussion lecture. Task 2. 2 X 50			0%
16				UAS			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.