

Universitas Negeri Surabaya Faculty of Engineering Civil Engineering Undergraduate Study Program

Document Code

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Courses			CODE			(Cour	se F	ami	ly	С	red	it We	ight	5	SEMES	STER	Cor Dat	npilati e	ion
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AUTHORIZAT	ION		SP Develo	per						Cοι	urse C	Clus	ster C	oordinato	or S	Study	Progra	um Co	ordina	tor
			Yogie Risdi Wulandari,	anto S.T.,	, S.T., M M.T.	.T.;N	ſeity			-						Yogie	Risdia	anto, S	.T., M. ⁻	т.
Learning model	Case Studies									•					ľ					
Program	PLO study p	rogra	am which is o	char	ged to t	he c	ours	e												
Outcomes	Program Obj	jectiv	ves (PO)																	
(PLO)	PO - 1	Stud	lents have the	abilit	y to desi	gn the	e use	of e	envir	onme	entally	/ frie	endly	prestresse	ed cor	ncrete	materia	als		
	PO - 2	Stud bala	lents have the ncing.	abilit	y to anal	yze p	restr	ess	force	es ba	sed o	n el	lastic	conditions	, con	crete-s	teel co	operat	ion & l	oad
	PO - 3	Stud bear	lents have the n (ST) and the	skills final	to analy stress o	/ze th f a sta	e eff atical	ect c ly in	of pr dete	estres ermina	ssing ate pr	forc estr	ce on ressec	the final si d beam (S	tress TT).	of a ce	ertain s	tatic pi	estres	sed
	PLO-PO Mat	rix																		
	PO Matrix at	P.O PO-1 PO-2 PO-3 trix at the end of each learning stage (Sub-PO)																		
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		F	PO-3					+												
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Short Course Description	Understanding posttensioning conditions, ste creep, relaxati sections, cast posttensioning Learning Meth	I erstanding and initial ideas about prestressed concrete, how to apply prestressing force to steel (pretensioning & tensioning), prestressing concrete and steel materials, basic principles of planning and analyzing cross-sections (elastic jitions, steel-concrete cooperation, load balancing), casting and cable pulling processes, loss prestressing forces (shrinkage, p, relaxation, due to slippage, friction, influence of length), cross-section planning and stress calculations for concrete ions, casting and running cables, shear stresses, danger situation diagrams for prestressed concrete, anchorage in tensioning systems, transverse tensile stresses at the final block of the limit moment. Learning is carried out using the Direct rning Method (MPL) and ends with discussion activities.																		
References	Main :															<u>.</u>	<u>.</u>			
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	Supporters:																			

Support lecturer	ting Muhammad In Yogie Risdian Meity Wulanda	naduddin, S.T., M.T. to, S.T., M.T. ari, S.T., M.T.					
Week-	Final abilities of each learning stage	Evalu	ation	He Lear Studer [Es	Ip Learning, ning methods, nt Assignments, stimated time]	Learning materials	Assessment Weight (%)
	(Sub-PO) (2) Able to understand prestressed concrete structures	Indicator	Criteria & Form	Offline (offline)	Online (<i>online</i>)	[References]	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	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: According to the rubric, test Form of Assessment : Participatory Activities	Lectures, Discussions, Questions and Answers 2 X 50		Material: Basic concepts of prestressingReader: TY Lin. 2000.Prestressed ConcreteStructure Design Volume 1. Mediana Translator. Jakarta: Literacy Development.Material: Basic concepts of prestressed ConcreteMaterial: Basic concepts of prestressed ConcreteMaterial: Basic concepts of prestressing Reader: Naaman E Antonie. 1982. Prestressed Concrete Analysis and Design Fundamentals. New York: McGraw-Hill.Material: Basic concepts of prestressing Reference: Nawy Edward G. 2001. Prestressed Concrete A Fundamental Approach Volume 1 Edition III. Bambang Suryoatmono Translator. Jakarta: Erlangga.Material: Basic concepts of prestressing Reference: Nawy Edward G. 2001. Prestressed Concrete A Fundamental Approach Volume 1 Edition III. Bambang Suryoatmono Translator. Jakarta: Erlangga.Material: Basic concepts of prestressing Reader: Raju Krishna. 1989. Prestressed Concrete Second Edition. Yani Sianipar Editor. Jakarta: Erlangga.	5%

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2	Able to	Explain	Criteria:	Lectures,		Material:	5%
	understand the	prestressed	According to the	Discussions,		Prestressed	
	use of	concrete materials.	rubric, test	Questions		concrete	
	prestressed		,	Questions		motorial	
	concrete		Form of	anu		natenal	
	materials		Assessment	Answers		Reference:	
			Assessment	2 X 50		TY Lin. 2000.	
			Participatory			Prestressed	
			Activities			Concrete	
						Structure	
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						Sianipar	
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4	Able to analyze	Explain the	Criteria:	Lectures,		Material:	5%
	the behavior of	analysis of	According to the	discussions		Analysis of	
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	concrete	concrete behavior		quesions		presuesseu	
			Form of	and		concrete	
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			Activities			Droctroccod	
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						Antonie. 1982.	
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Jakarta: Erlangga.						Editor.	
Erlangga.						Jakarta:	
Linangga.						Frlangga	

6	Able to analyze	Explains the	Criteria:	Lectures,		Material:	5%
	ine loss of	analysis of force	According to the	discussions,		Prestress loss	
	prestresseu	ioss in presiresseu	rubric, test	questions		analysis	
	final stress	stress cracking		and		Reference:	
	cracking	moment & ultimate	Form of	answers and		TY Lin. 2000.	
	moment &	moment.	Assessment :	individual		Prestressed	
	ultimate moment		Participatory	assignments		Concrete	
			Activities	2 X 50		Structure	
						Desian	
						Volume 1.	
						Mediana	
						Translator.	
						Jakarta:	
						Literacy	
						Development.	
						Material:	
						Prestress loss	
						analysis	
						Reader:	
						Naaman F	
						Antonie 1982	
						Prestressed	
						Concrete	
						Analysis and	
						Design	
						Fundamentals	
						New York	
						McGraw-Hill.	
						Material	
						Analysis of	
						loss of	
						nrestressing	
						force	
						References:	
						Nawy Edward	
						G 2001	
						Drestressed	
						Concrete A	
						Fundamental	
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						Volume 1	
						Edition III.	
						Bambang	
						Suryoatmono	
						Translator.	
						Jakarta:	
						Erlangga.	
						Material:	
						Analysis of	
						prestress loss	
						Reference:	
						Raju Krishna.	
						1989.	
						Prestressed	
						Concrete	
						Second	
						Edition. Yani	
						Sianipar	
						Editor.	
						Jakarta:	
						Erlangga.	

7	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: According to the rubric, test Form of Assessment : Participatory Activities	Lectures, discussions, questions and answers and individual assignments 2 X 50	Material: Prestress loss analysis Reference: TY Lin. 2000. Prestressed Concrete Structure Design Volume 1. Mediana Translator. Jakarta: Literacy Development. Material: Prestress loss analysis Reader: Naaman E Antonie. 1982. Prestressed Concrete Analysis and Design Fundamentals. New York: McGraw-Hill. Material: Analysis of loss of prestressing force References: Nawy Edward G. 2001. Prestressed Concrete A Fundamental Approach Volume 1 Edition III. Bambang Suryoatmono Translator. Jakarta: Erlangga. Material: Analysis of prestressed Concrete Second Fundamental Approach Volume 1 Edition III. Bambang Suryoatmono Translator. Jakarta: Erlangga.	10%
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. Form of Assessment : Participatory Activities	2 X 50		0%

9	Able to analyze	Explains the analysis of force	Criteria:	Lectures,	Material: force	5%
	prestressed	loss in prestressed	rubric, test	and	of prestressed	
	final stress,	stress, cracking	Form of	questions	concrete	
	cracking	moment & ultimate	Assessment :	answers	TY Lin. 2000.	
	ultimate moment	inomonu	Participatory	2 X 50	Prestressed	
			Activities		Concrete	
					Desian	
					Volume 1.	
					Mediana	
					Jakarta	
					Literacy	
					Development.	
					Material: loss	
					analysis of	
					prestressed	
					concrete	
					Naaman F	
					Antonie. 1982.	
					Prestressed	
					Analvsis and	
					Design	
					Fundamentals.	
					McGraw-Hill.	
					Material: force	
					of prestressed	
					concrete	
					Nawy Edward	
					G. 2001.	
					Prestressed	
					Concrete A Fundamental	
					Approach	
					Volume 1	
					Eanuon III. Bambana	
					Suryoatmono	
					Translator.	
					Erlangga.	
					Material: force	
					loss analysis	
					of prestressed	
					concrete Reader: Raiu	
					Krishna. 1989.	
					Prestressed	
					Concrete Second	
					Edition. Yani	
					Sianipar Editor	
					Lanor. Jakarta:	
					Erlangga.	

10	Able to analyze	Explains the	Criteria:	Lectures		Material: force	10%
10	the loss of	analysis of force	According to the	discussions		loss analysis	10%0
	prestressed	loss in prestressed	rubric, test	and		of prostrossed	
	concrete force,	concrete, final	,	questions		concrete	
	final stress,	stress, cracking	Form of	and		Deference	
	cracking	moment & ultimate	Assessment :	and		TV Lin 2000	
	ultimate moment	moment.	Participatory	2 X 50		Prostrossod	
	ultimate moment		Activities	2 \ 30		Concrete	
						Structure	
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						Antonie. 1982.	
						Concrete	
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						Design	
						Fundamentals.	
						New YOR:	
						wcGraw-mill.	
						Material: fares	
						Material: force	
						loss analysis	
						of prestressed	
						concrete	
						Reference:	
						Nawy Edward	
						G. 2001.	
						Prestressed	
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						Keader: Raju	
						KIISIINA. 1989.	
						Prestressed	
						Concrete	
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						Edition. Yani	
						Sianipar	
						Editor.	
						Jakarta:	
						Erlangga.	
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11	Able to analyze the loss of prestressed	Explains the analysis of force loss in prestressed	Criteria: According to the rubric, test	Lectures, discussions and	Material: force loss analysis of prestressed	5%
	concrete force, final stress, cracking moment &	concrete, final stress, cracking moment & ultimate moment.	Form of Assessment : Participatory	questions and answers	concrete Reference: TY Lin. 2000.	
	ultimate moment		Activities	2 X 50	Prestressea Concrete Structure Desian	
					Volume 1. Mediana Translator.	
					Jakarta: Literacy Development.	
					Material: loss of force analysis of	
					prestressed concrete Reference: Naaman F	
					Antonie. 1982. Prestressed Concrete	
					Analysis and Design Fundamentals. New York:	
					McGraw-Hill.	
					loss analysis of prestressed concrete	
					Reference: Nawy Edward G. 2001. Prestressed	
					Concrete A Fundamental Approach	
					Edition III. Bambang Suryoatmono	
					Translator. Jakarta: Erlangga.	
					Material: force loss analysis of prestressed	
					concrete Reader: Raju Krishna. 1989. Prestressed	
					Concrete Second Edition. Yani	
					Sianipar Editor. Jakarta: Erlangga.	

12	Able to analyze	Explains the	Criteria:	Lectures,	Material: force	10%
	the loss of prestressed	analysis of force loss in prestressed	According to the rubric, test	discussions	loss analysis	
	concrete force,	concrete, final	10010,1001	questions	concrete	
	cracking	moment & ultimate	Form of	and	Reference:	
	moment &	moment.	Assessment :	answers	TY Lin. 2000.	
	ultimate moment		Activities	2 X 50	Prestressed	
			/ 101111100		Structure	
					Design	
					Volume 1.	
					Mediana Translator	
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					analysis of	
					prestressed	
					concrete Reference:	
					Naaman E	
					Antonie. 1982.	
					Prestressed	
					Concrete Analysis and	
					Design	
					Fundamentals.	
					New York:	
					McGraw-Hill.	
					Material: force	
					loss analysis	
					of prestressed	
					Reference:	
					Nawy Edward	
					G. 2001.	
					Prestressed	
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					Edition III. Bambang	
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					Translator.	
					Jakarta:	
					∟riangga.	
					Material: force	
					loss analysis	
					ot prestressed	
					Reader: Raiu	
					Krishna. 1989.	
					Prestressed	
					Second	
					Edition. Yani	
					Sianipar	
					Editor.	
					Erlangga.	
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13	Able to analyze the loss of	Explains the analysis of force	Criteria: According to the	Lectures, discussions	Material: force loss analysis	5%
	prestressed concrete force, final stress	loss in prestressed concrete, final stress, cracking	rubric, test	and questions	of prestressed concrete	
	cracking	moment & ultimate	Form of	and	Reference:	
	moment & ultimate moment	moment.	Participatory	answers 2 X 50	TY LIN. 2000. Prestressed	
			Activities	27.00	Concrete	
					Structure	
					Design Volume 1	
					Mediana	
					Translator.	
					Jakana: Literacy	
					Development.	
					Material: loss	
					analysis of	
					prestressed	
					concrete	
					Naaman E	
					Antonie. 1982.	
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					Design	
					Fundamentals.	
					McGraw-Hill.	
					Material: force	
					loss analysis	
					concrete	
					Reference:	
					Nawy Edward	
					G. 2001. Prestressed	
					Concrete A	
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					Edition III.	
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					Translator.	
					Jakarta:	
					Erlangga.	
					Material: force	
					of prestressed	
					concrete	
					Reader: Raju	
					Krishna. 1989. Prestressed	
					Concrete	
					Second	
					Eaition. Yani Sianinar	
					Editor.	
					Jakarta:	
					Erlangga.	

14	Able to analyze	Explains the	Criteria:	Lectures.		Material: force	10%
	the loss of	analysis of force	According to the	discussions		loss analysis	
	prestressed	loss in prestressed	rubric test	and	1	of prostant	
	concrete force	concrete final		anu	1	or prestressed	
	final stress	stress cracking	F	questions	1	concrete	
	cracking	moment & ultimate	⊢orm of	and	1	Reference:	
	moment &	moment	Assessment :	answers		TY Lin 2000	
	ultimete memort	moment.	Participatory			Drootroood	
	ulumale moment		Activities	2 × 50		Presuesseu	
			Activities			Concrete	
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15	Able to analyze end block stress and stirrup requirement analysis.	Explain end block stress analysis and stirrup requirement analysis.	Criteria: According to the rubric, test Form of Assessment : Participatory Activities	Lectures, discussions, questions and answers, and individual assignments 2 X 50	Material: Endblock and stirrup stress analysis Reference: TY Lin. 2000. Prestressed Concrete Structure	10%
					Volume 1. Mediana Translator. Jakarta: Literacy Development. Material: Endblock and	
					surrup stress analysis Reference: Naaman E Antonie. 1982. Prestressed Concrete Analysis and Design Fundamentals. New York:	
					McGraw-Hill. Material: Endblock and stirrup stress analysis Reference: Nawy Edward G. 2001. Prestressed	
					Concrete A Fundamental Approach Volume 1 Edition III. Bambang Suryoatmono Translator. Jakarta: Erlanaga.	
					Material: Endblock and stirrup stress analysis Reader: Raju Krishna. 1989. Prestressed Concrete Sacond	
16					Edition. Yani Sianipar Editor. Jakarta: Erlangga.	0%

Evaluation Percentage Recap: Case Study

No	Evaluation	Percentage	
1.	Participatory Activities	100%	ſ
		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.
- 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.