	Universitas Negeri Surabaya Faculty of Engineering, Building Engineering Education Undergraduate Study Program	Document Code

SEMESTER LEARNING PLAN

Courses	CODE	Course Family	Credit Weight			SEMESTER	Compilation Date
Analysis of Static Indeterminate Structures	8320503002	Compulsory Study Program Subjects	T=3	P=0	ECTS=4.77	3	August 18, 2022

AUTHORIZATION	SP Developer	Course Cluster Coordinator	Study Program Coordinator
	Mochamad Firmansyah Sofianto, S.T., M.Sc., M.T. ; Suprapto, S.Pd., M.T.	-	Dr. Gde Agus Yudha Prawira Adistana, S.T., M.T.

Learning model: Project Based Learning

Program Learning Outcomes (PLO)

PLO study program that is charged to the course

Program Objectives (PO)

PO - 1	Students have mastery of the concepts and theories of M, N, D regarding civil engineering
PO - 2	Students have mastery of the application of M, N, D to civil engineering

PLO-PO Matrix

P.O
PO-1
PO-2

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																

Short Course Description: Introduction and analysis of statically indeterminate structures (continuous beam, fixed portal, swaying portal) Slopedeflection, Clayperon, and Cross methods. Learning is carried out using the Direct Learning Method (MPL) and ends with discussion activities.

References

Main :

1. Sabariman, Bambang.2007. Penyelesaian Statika Slope Deflection . Surabaya: JTS FT Unesa.
2. Sabariman, Bambang. 2013. Mekanika Teknik III (Metode Clapeyron). Surabaya: JTS FT Unesa.
3. Sabariman, Bambang. 2015. AnalisisStruktur Statis Tak Tentu (Metode Cross). Surabaya: JTS FT Unesa.
4. Sunggono.1984. Buku TeknikSipil. Jakarta: Penerbit Nova.
5. Wang, Chu-Kia. 1987. Analisis StrukturLanjutan Jilid 1, Kusuma Wirawan & Mulyadi Nataprawira Penterjemah.Jakarta: Erlangga.
6. Hibbeler, R.C. 2012. Structural Analysis, Eighth Edition . NewJersey: Pearson Prentice Hall.
7. Sabariman, B. & Dani, H.2015. Pemanfaatan Gambar Gaya Lintang dalam Perhitungan Momen Statis Tertentu, Jurnal Kajian Pendidikan TeknikBangunan Vol. 1 Nomer 1/JKPTB/2015.

Supporters:

Supporting lecturer: Dr. Suprapto, S.Pd., M.T.
Mochamad Firmansyah Sofianto, S.T., M.Sc., M.T.
Meity Wulandari, S.T., M.T.

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 differentiate between indeterminate static structures and certain static structures.	Explain the difference between a statically certain structure (ST) and a statically indeterminate structure (STT).	**Criteria:** 1. Score 15 if the explanation of the ST concept is correct 2. Score 15 if the explanation of the STT concept is correct. 3. Score 10 if the explanation of the slope deflection concept is correct. 4. Score 10 if the explanation of Clapeyron's concept is correct. 5. Score 10 if the explanation of the Cross concept is correct. 6. Score 10 if the explanation of the application software program concept is correct. 7. Score 10 if the application of M to the main reinforcement is correct. 8. Score 10 if the application of N to the stirrup reinforcement is correct. 9. Score 10 if the application of D to the stirrup reinforcement is correct.	Discussion lectures and questions and answers 3 X 50	Discussion lectures and questions and answers 3 X 50	**Material:** distinguishing statically indeterminate structures from certain static structures. **Bibliography:** *Sabariman, Bambang. 2013. Engineering Mechanics III (Clapeyron Method). Surabaya: JTS FT Unesa.* **Material:** distinguishing statically indeterminate structures from certain static structures. **References:** *Hibbeler, RC 2012. Structural Analysis, Eighth Edition . NewJersey: Pearson Prentice Hall.*	5%

2	Able to analyze forces in M (moment) N (normal force) and D (latitudinal force) Slope Deflection Method in beam structures.	Explains the analysis of MN and D STT beams using the Slope Deflection Method.	**Criteria:** 1. Score 70 if the moment calculation using the Slope Deflection method is correct 2. Score 15 if the free body diagram calculation includes the positioning reactions of latitude forces and normal forces correctly 3. Score 15 if the depiction of the MN and D fields is correct. **Form of Assessment** : Participatory Activities	Question and answer lecture and practice discussion of STT beam questions & discussion of 3 X 50	Question and answer lecture and practice discussion of STT beam questions & discussion of 3 X 50	**Material:** analyzing internal forces M (moment) N (normal force) and D (latitudinal force) Slope Deflection Method in beam structures. **Bibliography:** *Sabariman, Bambang. 2015. Static Indeterminate Structure Analysis (Cross Method). Surabaya: JTS FT Unesa.* **Material:** analyzing internal forces M (moment) N (normal force) and D (latitudinal force) Slope Deflection Method in beam structures. **References:** *Sabariman, Bambang. 2007. Solving Slope Deflection Statics. Surabaya: JTS FT Unesa.* **Material:** analyzing internal forces M (moment) N (normal force) and D (latitudinal force) Slope Deflection Method in beam structures. **References:** *Hibbeler, RC 2012. Structural Analysis, Eighth Edition . NewJersey: Pearson Prentice Hall.*	5%

3	Able to analyze forces in M (moment) N (normal force) and D (latitudinal force) Slope Deflection Method in beam structures.	Explains the analysis of MN and D STT beams using the Slope Deflection Method.	**Criteria:** 1. Score 70 if the moment calculation using the Slope Deflection method is correct 2. Score 15 if the free body diagram calculation includes the positioning reactions of latitude forces and normal forces correctly 3. Score 15 if the depiction of the MN and D fields is correct. **Form of Assessment** : Participatory Activities	Question and answer lecture and practice discussion of STT beam questions & discussion of 3 X 50	Question and answer lecture and practice discussion of STT beam questions & discussion of 3 X 50	**Material:** analyzing internal forces M (moment) N (normal force) and D (latitudinal force) Slope Deflection Method in beam structures. **Bibliography:** *Sabariman, Bambang. 2015. Static Indeterminate Structure Analysis (Cross Method). Surabaya: JTS FT Unesa.* **Material:** analyzing internal forces M (moment) N (normal force) and D (latitudinal force) Slope Deflection Method in beam structures. **References:** *Sabariman, Bambang. 2007. Solving Slope Deflection Statics. Surabaya: JTS FT Unesa.* **Material:** analyzing internal forces M (moment) N (normal force) and D (latitudinal force) Slope Deflection Method in beam structures. **References:** *Hibbeler, RC 2012. Structural Analysis, Eighth Edition . NewJersey: Pearson Prentice Hall.*	5%

4	Able to analyze forces in M (moment) N (normal force) and D (latitudinal force) Slope Deflection Method on portal structures (fixed & swaying)	Able to explain MN and D portal analysis (fixed & swaying) STT Slope Deflection Method	**Criteria:** A score of 70 if the moment calculation using the Slope Deflection method is correct. A score of 15 if the free body diagram calculation includes the positioning reaction of latitude forces and normal forces. A score of 15 if the depiction of the MN and D planes is correct.	Question and answer lecture and discussion practice on portal questions (fixed & swaying) STT & discussion Task 1 STT Slope Deflection Method 3 X 50	Question and answer lecture and discussion practice on portal questions (fixed & swaying) STT & discussion Task 1 STT Slope Deflection Method 3 X 50	**Material:** discussion of portals (fixed & swaying) STT & discussion Task 1 STT Slope Deflection Method\ **Reference:** *Sabariman, Bambang.2007. Solving Slope Deflection Statics. Surabaya: JTS FT Unesa.* **Material:** discussion of portals (fixed & swaying) STT & discussion Task 1 STT Slope Deflection Method **Literature:** *Sabariman, B. & Dani, H.2015. Utilization of Latitudinal Force Images in Calculating Certain Static Moments, Journal of Building Engineering Education Studies Vol. 1 Number 1/JKPTB/2015.* **Material:** discussion of portals (fixed & swaying) STT & discussion Task 1 STT Slope Deflection Method **Library:** *Sunggono.1984. Civil Engineering Books. Jakarta: Nova Publishers.*	5%

5	Able to analyze forces in M (moment) N (normal force) and D (latitudinal force) Slope Deflection Method on portal structures (fixed & swaying)	Able to explain MN and D portal analysis (fixed & swaying) STT Slope Deflection Method	**Criteria:** A score of 70 if the moment calculation using the Slope Deflection method is correct. A score of 15 if the free body diagram calculation includes the positioning reaction of latitude forces and normal forces. A score of 15 if the depiction of the MN and D planes is correct. **Form of Assessment** : Participatory Activities	Question and answer lecture and discussion practice on portal questions (fixed & swaying) STT & discussion Task 1 STT Slope Deflection Method 3 X 50	Question and answer lecture and discussion practice on portal questions (fixed & swaying) STT & discussion Task 1 STT Slope Deflection Method 3 X 50	**Material:** discussion of portals (fixed & swaying) STT & discussion Task 1 STT Slope Deflection Method\ **Reference:** *Sabariman, Bambang.2007. Solving Slope Deflection Statics. Surabaya: JTS FT Unesa.* **Material:** discussion of portals (fixed & swaying) STT & discussion Task 1 STT Slope Deflection Method **Literature:** *Sabariman, B. & Dani, H.2015. Utilization of Latitudinal Force Images in Calculating Certain Static Moments, Journal of Building Engineering Education Studies Vol. 1 Number 1/JKPTB/2015.* **Material:** discussion of portals (fixed & swaying) STT & discussion Task 1 STT Slope Deflection Method **Library:** *Sunggono.1984. Civil Engineering Books. Jakarta: Nova Publishers.*	5%
6	Completion of tasks with slope deflection	Able to complete MN and D sway portal analysis STT Slope Deflection Method.	**Criteria:** Score 70 if the moment calculation uses the Slope Deflection method. Score 15 if the free body diagram calculation includes the positioning reaction of latitude and normal forces. Score 15 if the depiction of the MN and D planes is correct.	QUIS 1 2 X 50	QUIS 1 2 X 50		10%

7	Able to analyze forces in M (moment) N (normal force) and D (latitudinal force) Clapeyron method (three moments postulate) in beam structures	Explain the analysis of MN and D STT beams Clapeyron Method (three moments postulate)	**Criteria:** A score of 70 if the moment calculation using the Clapeyron method is correct. A score of 15 if the calculation of the free body diagram includes the positioning reactions of latitudinal forces and normal forces. A score of 15 if the depiction of the MN and D planes is correct.	Question and answer lecture and practice discussion of STT beam questions & discussion of 3 X 50	Question and answer lecture and practice discussion of STT beam questions & discussion of 3 X 50	**Material:** analyzing internal forces M (moment) N (normal force) and D (latitudinal force) Clapeyron method (three moments postulate) in beam structures **Reference:** *Sabariman, Bambang. 2013. Engineering Mechanics III (Clapeyron Method). Surabaya: JTS FT Unesa.* **Material:** analyzing internal forces M (moments) N (normal forces) and D (latitudinal forces) Clapeyron method (three moments postulate) in beam structures **References:** *Wang, Chu-Kia. 1987. Advanced Structural Analysis Volume 1, Kusuma Wirawan & Mulyadi Nataprawira Translator. Jakarta: Erlangga.* **Material:** analyzing internal forces M (moments) N (normal forces) and D (latitudinal forces) Clapeyron method (three moments postulate) in beam structures **References:** *Sabariman, B. & Dani, H.2015. Utilization of Latitudinal Force Images in Calculating Certain Static Moments, Journal of Building Engineering Education Studies Vol. 1 Number 1/JKPTB/2015.*	5%

8	Able to analyze forces in M (moment) N (normal force) and D (latitudinal force) Clapeyron method (three moments postulate) in beam structures	Explain the analysis of MN and D STT beams Clapeyron Method (three moments postulate)	**Criteria:** A score of 70 if the moment calculation using the Clapeyron method is correct. A score of 15 if the calculation of the free body diagram includes the positioning reactions of latitudinal forces and normal forces. A score of 15 if the depiction of the MN and D planes is correct. **Form of Assessment** : Participatory Activities	Question and answer lecture and practice discussion of STT beam questions & discussion of 3 X 50	Question and answer lecture and practice discussion of STT beam questions & discussion of 3 X 50	**Material:** analyzing internal forces M (moment) N (normal force) and D (latitudinal force) Clapeyron method (three moments postulate) in beam structures **Reference:** *Sabariman, Bambang. 2013. Engineering Mechanics III (Clapeyron Method). Surabaya: JTS FT Unesa.* **Material:** analyzing internal forces M (moments) N (normal forces) and D (latitudinal forces) Clapeyron method (three moments postulate) in beam structures **References:** *Wang, Chu-Kia. 1987. Advanced Structural Analysis Volume 1, Kusuma Wirawan & Mulyadi Nataprawira Translator. Jakarta: Erlangga.* **Material:** analyzing internal forces M (moments) N (normal forces) and D (latitudinal forces) Clapeyron method (three moments postulate) in beam structures **References:** *Sabariman, B. & Dani, H.2015. Utilization of Latitudinal Force Images in Calculating Certain Static Moments, Journal of Building Engineering Education Studies Vol. 1 Number 1/JKPTB/2015.*	5%

9	Able to analyze forces in M (moment) N (normal force) and D (latitudinal force) Clapeyron method (three moments postulate) in portal structures (fixed & swaying)	Explain the analysis of MN and D portals (fixed & swaying) STT Clapeyron Method (three moment postulate)	**Criteria:** A score of 70 if the moment calculation using the Clapeyron method is correct. A score of 15 if the calculation of the free body diagram includes the positioning reactions of latitudinal forces and normal forces. A score of 15 if the depiction of the MN and D planes is correct.	Question and answer lecture and discussion practice on portal questions (fixed & swaying) STT & discussion Task 2 STT Clapeyron Method 3 X 50	Question and answer lecture and discussion practice on portal questions (fixed & swaying) STT & discussion Task 2 STT Clapeyron Method 3 X 50	**Material:** analyzing internal forces M (moments) N (normal forces) and D (latitudinal forces) Clapeyron method (three moments postulate) in portal structures (fixed & swaying) **References:** *Sabariman, Bambang. 2013. Engineering Mechanics III (Clapeyron Method). Surabaya: JTS FT Unesa.* **Material:** analyzing internal forces M (moments) N (normal forces) and D (latitudinal forces) Clapeyron method (three moments postulate) in portal structures (fixed & swaying) **References:** *Sabariman, B. & Dani, H.2015. Utilization of Latitudinal Force Images in Calculating Certain Static Moments, Journal of Building Engineering Education Studies Vol. 1 Number 1/JKPTB/2015.* **Material:** analyzing internal forces M (moment) N (normal force) and D (latitudinal force) Clapeyron method (three moments postulate) in portal structures (fixed & swaying) **References:** *Wang, Chu-Kia. 1987. Advanced Structural Analysis Volume 1, Kusuma Wirawan & Mulyadi Nataprawira Translator. Jakarta: Erlangga.*	5%
10	Able to analyze forces in M (moment) N (normal force) and D (latitudinal force) Clapeyron	Explain the analysis of MN and D portals (fixed & swaying) STT	**Criteria:** A score of 70 if the moment calculation using the Clapeyron method is correct. A score of 15 if the	Question and answer lecture and discussion practice on	Question and answer lecture and discussion practice on portal questions (fixed & swaying) STT &	**Material:** analyzing internal forces M (moments) N (normal forces)	5%

	method (three moments postulate) in portal structures (fixed & swaying)	Clapeyron Method (three moment postulate)	calculation of the free body diagram includes the positioning reactions of latitudinal forces and normal forces. A score of 15 if the depiction of the MN and D planes is correct. **Form of Assessment** : Participatory Activities	portal questions (fixed & swaying) STT & discussion Task 2 STT Clapeyron Method 3 X 50	discussion Task 2 STT Clapeyron Method 3 X 50	and D (latitudinal forces) Clapeyron method (three moments postulate) in portal structures (fixed & swaying) **References:** *Sabariman, Bambang. 2013. Engineering Mechanics III (Clapeyron Method). Surabaya: JTS FT Unesa.* **Material:** analyzing internal forces M (moments) N (normal forces) and D (latitudinal forces) Clapeyron method (three moments postulate) in portal structures (fixed & swaying) **References:** *Sabariman, B. & Dani, H.2015. Utilization of Latitudinal Force Images in Calculating Certain Static Moments, Journal of Building Engineering Education Studies Vol. 1 Number 1/JKPTB/2015.* **Material:** analyzing internal forces M (moment) N (normal force) and D (latitudinal force) Clapeyron method (three moments postulate) in portal structures (fixed & swaying) **References:** *Wang, Chu-Kia. 1987. Advanced Structural Analysis Volume 1, Kusuma Wirawan & Mulyadi Nataprawira Translator. Jakarta: Erlangga.* **Material:** analyzing internal forces M (moments) N (normal forces) and D (latitudinal forces) Clapeyron method (three		

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11	UTS 2.	Able to complete the analysis of MN and D sway portal STT Clapeyron Method	**Criteria:** A score of 70 if the moment calculation using the Clapeyron method is correct. A score of 15 if the calculation of the free body diagram includes the positioning reactions of latitudinal forces and normal forces. A score of 15 if the depiction of the MN and D planes is correct.	Written exam by collecting 2.3 X 50 assignments	Written exam by collecting 2.3 X 50 assignments		10%

12	Able to analyze forces in M (moment) N (normal force) and D (Latitudinal force) Cross Method in beam structures	Explains the analysis of MN and D STT beams using the Cross Method	**Criteria:** A score of 70 if the Cross method moment calculation is correct. A score of 15 if the free body diagram calculation includes the reaction to the placement of latitude forces and normal forces is correct. A score of 15 if the depiction of the MN and D planes is correct. **Form of Assessment** : Participatory Activities	Question and answer lectures and practice discussions on STT beam questions & discussions. 3 X 50	Question and answer lectures and practice discussions on STT beam questions & discussions.	**Material:** analyzing internal forces M (moment) N (normal force) and D (latitudinal force) Cross method in beam structures **References:** *Sabariman, Bambang. 2015. Static Indeterminate Structure Analysis (Cross Method). Surabaya: JTS FT Unesa.* **Material:** analyzing internal forces M (moment) N (normal force) and D (latitudinal force) Cross method in beam structures **References:** *Sabariman, B. & Dani, H.2015. Utilization of Latitudinal Force Images in Calculating Certain Static Moments, Journal of Building Engineering Education Studies Vol. 1 Number 1/JKPTB/2015.* **Material:** analyzing forces in M (moment) N (normal force) and D (latitudinal force) Cross method in beam structures **References:** *Wang, Chu-Kia. 1987. Advanced Structural Analysis Volume 1, Kusuma Wirawan & Mulyadi Nataprawira Translator. Jakarta: Erlangga.*	5%

13	Able to analyze forces in M (moment) N (normal force) and D (Latitudinal force) Cross Method in beam structures	Explains the analysis of MN and D STT beams using the Cross Method	**Criteria:** A score of 70 if the Cross method moment calculation is correct. A score of 15 if the free body diagram calculation includes the reaction to the placement of latitude forces and normal forces is correct. A score of 15 if the depiction of the MN and D planes is correct. **Form of Assessment** : Participatory Activities	Question and answer lectures and practice discussions on STT beam questions & discussions. 3 X 50	Question and answer lectures and practice discussions on STT beam questions & discussions. 3 X 50	**Material:** analyzing internal forces M (moment) N (normal force) and D (latitudinal force) Cross method in beam structures **References:** *Sabariman, Bambang. 2015. Static Indeterminate Structure Analysis (Cross Method). Surabaya: JTS FT Unesa.* **Material:** analyzing internal forces M (moment) N (normal force) and D (latitudinal force) Cross method in beam structures **References:** *Sabariman, B. & Dani, H.2015. Utilization of Latitudinal Force Images in Calculating Certain Static Moments, Journal of Building Engineering Education Studies Vol. 1 Number 1/JKPTB/2015.* **Material:** analyzing forces in M (moment) N (normal force) and D (latitudinal force) Cross method in beam structures **References:** *Wang, Chu-Kia. 1987. Advanced Structural Analysis Volume 1, Kusuma Wirawan & Mulyadi Nataprawira Translator. Jakarta: Erlangga.*	5%

14	Able to analyze internal forces M (moment) N (normal force) and D (Latitudinal force) Cross Method on portal structures (fixed & swaying)	Explains the analysis of MN and D portals (fixed & swaying) STT Cross Method	**Criteria:** Score 70 if the moment calculation using the Cross method is correct. Score 15 if the calculation of the free body diagram includes the positioning reaction of latitude forces and normal forces. Score 15 if the depiction of the MN and D planes is correct. **Form of Assessment** : Test	Question and answer lecture and discussion practice on portal questions (fixed & swaying) STT & discussion Task 3 STT Cross Method 3 X 50	Question and answer lecture and discussion practice on portal questions (fixed & swaying) STT & discussion Task 3 STT Cross Method 3 X 50	**Material:** analyzing internal forces M (moment) N (normal force) and D (latitudinal force) Cross method on portal structures (fixed & swaying) **References:** *Sabariman, Bambang. 2015. Static Indeterminate Structure Analysis (Cross Method). Surabaya: JTS FT Unesa.* **Material:** analyzing internal forces M (moment) N (normal force) and D (latitudinal force) Cross method on portal structures (fixed & swaying) **References:** *Sabariman, B. & Dani, H.2015. Utilization of Latitudinal Force Images in Calculating Certain Static Moments, Journal of Building Engineering Education Studies Vol. 1 Number 1/JKPTB/2015.* **Material:** analyzing internal forces M (moment) N (normal force) and D (latitudinal force) Cross method on portal structures (fixed & swaying) **References:** *Wang, Chu-Kia. 1987. Advanced Structural Analysis Volume 1, Kusuma Wirawan & Mulyadi Nataprawira Translator. Jakarta: Erlangga.*	5%

15	Able to analyze internal forces M (moment) N (normal force) and D (Latitudinal force) Cross Method on portal structures (fixed & swaying)	Explains the analysis of MN and D portals (fixed & swaying) STT Cross Method	**Criteria:** Score 70 if the moment calculation using the Cross method is correct. Score 15 if the calculation of the free body diagram includes the positioning reaction of latitude forces and normal forces. Score 15 if the depiction of the MN and D planes is correct. **Form of Assessment** : Participatory Activities	Question and answer lecture and discussion practice on portal questions (fixed & swaying) STT & discussion Task 3 STT Cross Method 3 X 50	Question and answer lecture and discussion practice on portal questions (fixed & swaying) STT & discussion Task 3 STT Cross Method 3 X 50	**Material:** analyzing internal forces M (moment) N (normal force) and D (latitudinal force) Cross method on portal structures (fixed & swaying) **References:** *Sabariman, Bambang. 2015. Static Indeterminate Structure Analysis (Cross Method). Surabaya: JTS FT Unesa.* **Material:** analyzing internal forces M (moment) N (normal force) and D (latitudinal force) Cross method on portal structures (fixed & swaying) **References:** *Sabariman, B. & Dani, H.2015. Utilization of Latitudinal Force Images in Calculating Certain Static Moments, Journal of Building Engineering Education Studies Vol. 1 Number 1/JKPTB/2015.* **Material:** analyzing internal forces M (moment) N (normal force) and D (latitudinal force) Cross method on portal structures (fixed & swaying) **References:** *Wang, Chu-Kia. 1987. Advanced Structural Analysis Volume 1, Kusuma Wirawan & Mulyadi Nataprawira Translator. Jakarta: Erlangga.*	5%
16				3 X 50 Semester Final Exam	analyze the internal force M (moment) N (normal force) and D (Latitudinal force) Cross Method on portal structures (fixed & swaying) 3 X 50		0%

Evaluation Percentage Recap: Project Based Learning

No	Evaluation	Percentage
1.	Participatory Activities	40%
2.	Test	5%
		45%

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.