						Document Code
![UNESA logo]	**Universitas Negeri Surabaya** **Faculty of Engineering,** **Mechanical Engineering Undergraduate Study Program**					

SEMESTER LEARNING PLAN

Courses		CODE	Course Family	Credit Weight				SEMESTER	Compilation Date
Mechanics and Strength of Materials 1		2120102121		**T=2**	**P=0**	**ECTS=3.18**		2	July 16, 2024

AUTHORIZATION	SP Developer	Course Cluster Coordinator	Study Program Coordinator
	....	....	Ir. Priyo Heru Adiwibowo, S.T., M.T.

Learning model	Case Studies

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	Understand the resultant of 2 unidirectional forces at one capture point. Understand the resultant of 2 forces in opposite directions at one capture point. Understand the resultant of 2 forces that form an angle of 900 at one capture point. Understand the resultant of 2 forces that form an arbitrary angle at one capture point. Understand the resultant for more than 2 forces at one capture point. Understanding Varignon's Moment theorem. Understand the graphical requirements for balance of a plane style arrangement. Understand the requirements of balance techniques. Understand how to determine the center of gravity of flat images. Understanding Cremona diagrams for flat frames. Understand the Culman and Ritter intersection methods

References	Main :

1. Ferdinand P. Bear dan E.Russell Johnston, Jr. 1987. Statika. (Mekanika untuk Insinyur), Erlangga Jakarta
2. Russel C. Hibbler. Engineering Mechanics:Statics, 13th edition. Prentice Hall
3. Russel C Hibbler. Mechanics of Material, 8th edition. Prentice Hall
4. S. Timosenko, DH Young. 1990. Mekanika Teknik, Jakarta, Penerbit Erlangga
5. Soenarko. 1988. Mekanika Kekuatan Material 1. Surabaya: Institut Teknologi Sepuluh Nopember

	Supporters:

Supporting lecturer	Iskandar, S.T., M.T. Dr. Mohammad Effendy, S.T., M.T. Novi Sukma Drastiawati, S.T., M.Eng. Ahmad Saepuddin, S.T., M.Sc. Hanna Zakiyya, 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	Know what is meant by forces on a flat plane	Able to determine the resultant of two or more forces using vectors. Able to calculate the resultant of two or more forces using vectors	**Criteria:** 1.Attendance 20% 2.Assignments, attendance and quizzes 30% 3.UTS 20% 4.UAS 30%	Lectures, discussions and questions and answers 2 X 50			0%
2	Continuing Meeting 1	Able to calculate the magnitude of the resultant of more than 2 forces graphically Analyze the magnitude of the resultant and two forces Describe the resultant of more than 2 forces	**Criteria:** 1.Attendance 20% 2.Assignments, attendance and quizzes 30% 3.UTS 20% 4.UAS 30%	Lectures, discussions and questions and answers 2 X 50			0%
3	Continue meeting 2	Describes styles in components. Determining the perpendicular components of a force, Adding forces by adding	**Criteria:** 1.Attendance 20% 2.Assignments, attendance and quizzes 30% 3.UTS 20% 4.UAS 30%	Lectures, discussions and questions and answers 2 X 50			0%
4	Equilibrium of a particle	Understanding particle balance Analyzing particle balance	**Criteria:** 1.Attendance 20% 2.Assignments, attendance and quizzes 30% 3.UTS 20% 4.UAS 30%	Lectures, discussions and questions and answers 2 X 50			0%
5	Style in space	Understand the concept of force in the field of space. Describe the components of force in the field of space	**Criteria:** 1.Attendance 20% 2.Assignments, attendance and quizzes 30% 3.UTS 20% 4.UAS 30%	Lectures, discussions and questions and answers 2 X 50			0%
6	Rigid body statics	Understand external and internal forces. Understand the moment of force about the axis	**Criteria:** 1.Attendance 20% 2.Assignments, attendance and quizzes 30% 3.UTS 20% 4.UAS 30%	Lectures, discussions and questions and answers 2 X 50			0%
7	Types of SupportStructure Analysis	Understand the types of supports. Be able to analyze structures and frames	**Criteria:** 1.Attendance 20% 2.Assignments, attendance and quizzes 30% 3.UTS 20% 4.UAS 30%	Lectures, discussions and questions and answers 2 X 50			0%
8	UTS	Do the questions in writing	**Criteria:** Ability to take Midterm Exams	Take the written exam 2 X 50			0%
9	The concept of stress, strain and material properties	Explains stress, strain. Explains the properties of materials	**Criteria:** 1.Attendance 20% 2.Assignments, attendance and quizzes 30% 3.UTS 20% 4.UAS 30%	Lecture Discussion Questions and Answers 2 X 50			0%

10	Analyzing Normal Stress and Shear Stress	1. Students are able to analyze Normal Voltage2. Students are able to analyze Normal Strain3. Students are able to analyze Shear Stress	**Criteria:** 1.Attendance 20% 2.Assignments, attendance and quizzes 30% 3.UTS 20% 4.UAS 30%	Lectures, discussions and questions and answers 2 X 50			0%
11	Analysis of stress due to torsion loads or twisting moments	Students are able to calculate and analyze stress due to torsional loads/twisting moments	**Criteria:** 1.Attendance 20% 2.Assignments, attendance and quizzes 30% 3.UTS 20% 4.UAS 30%	Lectures, discussions and questions and answers 2 X 50			0%
12	Stress analysis due to pure bending	Students are able to analyze stresses caused by pure bending	**Criteria:** 1.Attendance 20% 2.Assignments, attendance and quizzes 30% 3.UTS 20% 4.UAS 30%	Lectures, discussions and questions and answers 2 X 50			0%
13	Stress analysis (normal and shear) due to latitudinal loads	Students are able to calculate and analyze stresses (normal and shear) due to latitudinal loads	**Criteria:** 1.Attendance 20% 2.Assignments, attendance and quizzes 30% 3.UTS 20% 4.UAS 30%	Lectures, discussions and questions and answers 2 X 50			0%
14	Stress analysis (normal and shear) due to latitudinal loads	Students are able to calculate and analyze stresses (normal and shear) due to latitudinal loads	**Criteria:** 1.Attendance 20% 2.Assignments, attendance and quizzes 30% 3.UTS 20% 4.UAS 30%	Lectures, discussions and questions and answers 2 X 50			0%
15	Static failure theory (due to a single load) and safety figures	Students know the theory of static failure and are able to analyze materials	**Criteria:** 1.Attendance 20% 2.Assignments, attendance and quizzes 30% 3.UTS 20% 4.UAS 30%	Lectures, discussions and questions and answers 2 X 50			0%
16							0%

Evaluation Percentage Recap: Case Study

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.