	Universitas Negeri Surabaya **Faculty of Mathematics and Natural Sciences** **Physics Education Undergraduate Study Program**	**Document Code**

SEMESTER LEARNING PLAN

Courses	CODE	Course Family		Credit Weight			SEMESTER	Compilation Date
Lasers and Fiber Optics	8420302111			**T=2**	**P=0**	**ECTS=3.18**	7	July 18, 2024

AUTHORIZATION	SP Developer	Course Cluster Coordinator	Study Program Coordinator
	....	....	Mita Anggaryani, M.Pd., Ph.D.

Learning model	**Project Based Learning**

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	Course Description: This course discusses the basic properties of lasers and optical fibers, transformations in laser light, developments in optical fiber technology, various types of lasers and optical fibers, and their applications in life, through active learning with a combination of lecture and discussion methods. , questions and answers, assignments, and presentations.

References	**Main :**
	1. Svelto, Orazio.1998. Principles of Lasers Fourth Edition . Springer. 2. Thyagarajan, K., Ghatak, K. 2010. Laser Fundamentals and Applications Second Edition. Springer. 3. Silfvast, William T. 2010. Laser Fundamentals Second Edition . Cambridge University Press. 4. Haken, H. 1985. Light Volume 2 Laser Light Dynamics . North Holland Physics Publishing. 5. Power, John. An Introduction to Optical Fiber System Second Edition . McGraw Hill. 6. Noe, Reinhard. 2010. Essential of Modern Optical Fiber . Springer. 7. Mitschke, Fedor. 2009. Fiber Optics Physics and Technology. Springer. 8. Jurnal-jurnal ilmiah terkait.
	Supporters:

Supporting lecturer	ASNAWI Prof. Dr. Munasir, S.Si., M.Si. Meta Yantidewi, S.Si., M.Si.

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	Students are able to understand the basic concepts of lasers	Students are able to explain the basic concepts of lasers	**Criteria:** Get full marks if you can explain and analyze the basic characteristics of laser light	Lecture Discussion Questions and answers 2 X 50			0%
2	Students are able to understand the concept of laser beam transformation	Students can explain the concepts of propagation, amplification, frequency conversion and pulses	**Criteria:** Get full marks if you can explain and analyze the basic characteristics of laser light	Lecture Discussion Questions and answers 2 X 50			0%

3	Students are able to understand the various types of lasers	1.Students are able to explain the concept of semiconductor lasers 2.Students are able to explain the concept of solid state lasers 3.Students are able to explain the concept of gas lasers	**Criteria:** Get full marks if you can explain and answer questions in the discussion/question and answer session	PresentationDiscussionQuestions and answersTasks 2 X 50			0%
4	Students are able to understand the various types of lasers	1.Students are able to explain the concept of semiconductor lasers 2.Students are able to explain the concept of solid state lasers 3.Students are able to explain the concept of gas lasers	**Criteria:** Get full marks if you can explain and answer questions in the discussion/question and answer session	PresentationDiscussionQuestions and answersTasks 2 X 50			0%
5	Students are able to understand the various types of lasers	1.Students are able to explain the concept of semiconductor lasers 2.Students are able to explain the concept of solid state lasers 3.Students are able to explain the concept of gas lasers	**Criteria:** Get full marks if you can explain and answer questions in the discussion/question and answer session	PresentationDiscussionQuestions and answersTasks 2 X 50			0%
6	Students are able to understand various applications in the field of science	Students are able to explain and analyze the use of lasers in the field of science	**Criteria:** Get full marks if you can explain and answer questions in the discussion/question and answer session	PresentationDiscussionQuestions and answersTasks 2 X 50			0%
7	Students are able to understand the various applications of lasers in the industrial sector	Students are able to explain and analyze the use of lasers in the industrial sector	**Criteria:** Get full marks if you can explain and answer questions in the discussion/question and answer session	PresentationDiscussionQuestions and answersTasks 2 X 50			0%
8	UTS	UTS	**Criteria:** UTS	UTS 2 X 50			0%
9	Students are able to understand the concept of basic characteristics of optical fiber	1.Students are able to explain the basic concepts of polarization, dispersion and waveguides in optical fibers 2.Students are able to explain the basic concepts of losses and coupling modes in optical fibers	**Criteria:** Get full marks if you can explain and analyze the basic characteristics of optical fibers	Lecture Discussion Questions and answers Assignment 2 X 50			0%
10	Students are able to understand the various types of optical fibers and their components	1.Students are able to identify and explain the various types of optical fibers 2.Students are able to explain the mechanical properties of fiber optic components and their functions	**Criteria:** Get full marks if you can solve all the questions given	LectureDiscussionQuestions and answersTasks 2 X 50			0%

No	Learning Outcome	Indicators	Assessment	Learning Method			Weight
11	Students are able to understand the various types of optical fibers and their components	1. Students are able to identify and explain the various types of optical fibers 2. Students are able to explain the mechanical properties of fiber optic components and their functions	**Criteria:** Get full marks if you can solve all the questions given	LectureDiscussionQuestions and answersTasks 2 X 50			0%
12	Students are able to understand the concept of fiber optic technology and its applications	1. Students can identify and explain the differences between various types of fiber optic technology and their developments 2. Students can explain various applications of optical fiber in life		PresentationTaskDiscussionQuestions and answers 2 X 50			0%
13	Students are able to understand the concept of fiber optic technology and its applications	1. Students can identify and explain the differences between various types of fiber optic technology and their developments 2. Students can explain various applications of optical fiber in life	**Criteria:** Get full marks if you can explain and answer questions in the discussion/question and answer session	PresentationTaskDiscussionQuestions and answers 2 X 50			0%
14	Students are able to understand the concept of fiber optic technology and its applications	1. Students can identify and explain the differences between various types of fiber optic technology and their developments 2. Students can explain various applications of optical fiber in life	**Criteria:** Get full marks if you can explain and answer questions in the discussion/question and answer session	PresentationTaskDiscussionQuestions and answers 2 X 50			0%
15	Students are able to understand the concept of fiber optic technology and its applications	1. Students can identify and explain the differences between various types of fiber optic technology and their developments 2. Students can explain various applications of optical fiber in life	**Criteria:** Get full marks if you can explain and answer questions in the discussion/question and answer session	PresentationTaskDiscussionQuestions and answers 2 X 50			0%
16							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.