	Universitas Negeri Surabaya **Faculty of Engineering,** **Electrical Engineering Undergraduate Study Program**	**Document Code**

SEMESTER LEARNING PLAN

Courses	CODE	Course Family	Credit Weight			SEMESTER	Compilation Date
Optoelectronic Devices	2020102030		T=2	P=0	ECTS=3.18	6	July 18, 2024

AUTHORIZATION	SP Developer	Course Cluster Coordinator	Study Program Coordinator
	.....	.....	Dr. Lusia Rakhmawati, 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	Students understand the working principles and applications of optoelectronic devices. Students are able to apply optoelectronic device components in the electrical field
References	**Main :**
	1. J. Wilson, dan J.F.B. Hawkes. 1989. Optoelectronics, an introduction. Prentice Hall 2. S.O. Kasap. 2001. Optoelectronics And photonics Principles and Practices. Prentice Hall
	Supporters:
Supporting lecturer	Prof. Dr. Bambang Suprianto, M.T. Reza Rahmadian, S.ST., M.EngSc.

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	Understanding the concept of light waves Understanding: Polarization Superposition Interference Diffraction Understanding optical components: Convex and concave lenses Fresnel lenses B	1.Can explain the concept of light waves Can explain: Polarization 2.Superposition 3.Interference 4.Diffraction 5.Can explain about optical components: convex and concave lenses 6.fresnel lens 7.etc		Model: Cooperative learningMethod: Discussion Scientific Approach:- ObservingListening to the lecturer's explanation regarding the theory of light waves- AskingDiscussing solutions to problems- ExploringMaking observation reports regarding the theory of light waves-Associating Analyzing the results of observations- CommunicatingDiscussing the results of observations. 2 X 50			0%

2	Understanding the concept of light waves Understanding: Polarization Superposition Interference Diffraction Understanding optical components: Convex and concave lenses Fresnel lenses B	1.Can explain the concept of light waves Can explain: Polarization 2.Superposition 3.Interference 4.Diffraction 5.Can explain about optical components: convex and concave lenses 6.fresnel lens 7.etc		Model: Cooperative learningMethod: Discussion Scientific Approach:- ObservingListening to the lecturer's explanation regarding the theory of light waves- AskingDiscussing solutions to problems- ExploringMaking observation reports regarding the theory of light waves-Associating Analyzing the results of observations- CommunicatingDiscussing the results of observations. 2 X 50			0%
3	Understanding the concept of light waves Understanding: Polarization Superposition Interference Diffraction Understanding optical components: Convex and concave lenses Fresnel lenses B	1.Can explain the concept of light waves Can explain: Polarization 2.Superposition 3.Interference 4.Diffraction 5.Can explain about optical components: convex and concave lenses 6.fresnel lens 7.etc		Model: Cooperative learningMethod: Discussion Scientific Approach:- ObservingListening to the lecturer's explanation regarding the theory of light waves- AskingDiscussing solutions to problems- ExploringMaking observation reports regarding the theory of light waves-Associating Analyzing the results of observations- CommunicatingDiscussing the results of observations. 2 X 50			0%
4	Students Understand how Lasers work Students classify and understand Laser classes: Semiconductor Laser Doped Insulator Gas Laser Liquid Laser Parametric Laser The Free Electron Laser	1.Students Understand how Lasers work Students Explain and understand Laser classes: Laser Semiconductors 2.Doped Insulators 3.Gas Lasers 4.Liquid Lasers 5.Parametric Lasers 6.The Free Electron Laser		Model: Cooperative learningMethod: Discussion Scientific Approach:- ObservingListening to the lecturer's explanation regarding Laser Theory and classification- AskingDiscussing solutions to problems- ExploringMaking observation reports regarding Laser Theory and classification- AssociatingAnalyzing observation results- CommunicatingDiscussing observation results. 2 X 50			0%
5	Students Understand how Lasers work Students classify and understand Laser classes: Semiconductor Laser Doped Insulator Gas Laser Liquid Laser Parametric Laser The Free Electron Laser	1.Students Understand how Lasers work Students Explain and understand Laser classes: Laser Semiconductors 2.Doped Insulators 3.Gas Lasers 4.Liquid Lasers 5.Parametric Lasers 6.The Free Electron Laser		Model: Cooperative learningMethod: Discussion Scientific Approach:- ObservingListening to the lecturer's explanation regarding Laser Theory and classification- AskingDiscussing solutions to problems- ExploringMaking observation reports regarding Laser Theory and classification- AssociatingAnalyzing observation results- CommunicatingDiscussing observation results. 2 X 50			0%
6	Understanding the concept of Display Devices includes: Photoluminescence Cathode Ray Tube LED Plasma Display LCD	1.Can explain the concept of Display Devices including: Photoluminescence 2.Cathode Ray Tube 3.LEDs 4.Plasma Displays 5.LCD		Model: Cooperative learningMethod: Discussion Scientific Approach:- ObservingListening to the lecturer's explanation regarding the theory of light waves- AskingDiscussing solutions to problems- ExploringMaking observation reports regarding the theory of light waves-Associating Analyzing the results of observations- CommunicatingDiscussing the results of observations. 2 X 50			0%

7	Understanding the concept of Display Devices includes: Photoluminescence Cathode Ray Tube LED Plasma Display LCD	1.Can explain the concept of Display Devices including: Photoluminescence 2.Cathode Ray Tube 3.LEDs 4.Plasma Displays 5.LCD		Model: Cooperative learningMethod: Discussion Scientific Approach:-ObservingListening to the lecturer's explanation regarding the theory of light waves-AskingDiscussing solutions to problems-ExploringMaking observation reports regarding the theory of light waves-Associating Analyzing the results of observations-CommunicatingDiscussing the results of observations. 2 X 50			0%
8	Understand the concept of converting light to electricity: Photodetector includes Quantum EfficiencyVacuum PhotodiodeUVTRONPhotomultiplier (PMT)PhotoconductivePhotodiodePVCMOS image censorPhototransistorCharge Couple Device	1.can explain the concept of converting light to electricity: Photodetector includes Quantum Efficiency 2.Vacuum Photodiode 3.UVTRON 4.Photomultiplier (PMT) 5.Photoconductive 6.Photodiodes 7.PV 8.CMOS image sensors 9.Phototransistors 10.Charge Couple Device		Model: Cooperative learningMethod: Discussion Scientific Approach:-ObservingListening to the lecturer's explanation regarding the theory of light waves-AskingDiscussing solutions to problems-ExploringMaking observation reports regarding the theory of light waves-Associating Analyzing the results of observations-CommunicatingDiscussing the results of observations. 2 X 50			0%
9	Midterm exam	Midterm exam		Model: Cooperative learningMethod: Discussion Scientific Approach:-ObservingListening to the lecturer's explanation regarding the theory of light waves-AskingDiscussing solutions to problems-ExploringMaking observation reports regarding the theory of light waves-Associating Analyzing the results of observations-CommunicatingDiscussing the results of observations. 2 X 50			0%
10	Understand the concept of converting light to electricity: Photodetector includes Quantum EfficiencyVacuum PhotodiodeUVTRONPhotomultiplier (PMT)PhotoconductivePhotodiodePVCMOS image censorPhototransistorCharge Couple Device	1.can explain the concept of converting light to electricity: Photodetector includes Quantum Efficiency 2.Vacuum Photodiode 3.UVTRON 4.Photomultiplier (PMT) 5.Photoconductive 6.Photodiodes 7.PV 8.CMOS image sensors 9.Phototransistors 10.Charge Couple Device		Model: Cooperative learningMethod: Discussion Scientific Approach:-ObservingListening to the lecturer's explanation regarding the theory of light waves-AskingDiscussing solutions to problems-ExploringMaking observation reports regarding the theory of light waves-Associating Analyzing the results of observations-CommunicatingDiscussing the results of observations. 2 X 50			0%
11	Understanding the concept of optical fiber and its propagation Fiber Dispersion Multimode step index fiber intermodal dispersion single mode fiber graded index fiber material dispersion fiber losses OTDR	1.Can explain the concept of optical fiber and its propagation, Fiber Dispersion 2.Multimode step index fiber 3.intermodal dispersion 4.single mode fiber 5.graded index fiber 6.dispersion material 7.fiber losses 8.OTDR		Model: Cooperative learningMethod: Discussion Scientific Approach:-ObservingListening to the lecturer's explanation regarding the theory of light waves-AskingDiscussing solutions to problems-ExploringMaking observation reports regarding the theory of light waves-Associating Analyzing the results of observations-CommunicatingDiscussing the results of observations. 2 X 50			0%

12	Understanding the concept of optical fiber and its propagation Fiber Dispersion Multimode step index fiber intermodal dispersion single mode fiber graded index fiber material dispersion fiber losses OTDR	1.Can explain the concept of optical fiber and its propagation, Fiber Dispersion 2.Multimode step index fiber 3.intermodal dispersion 4.single mode fiber 5.graded index fiber 6.dispersion material 7.fiber losses 8.OTDR		Model: Cooperative learningMethod: Discussion Scientific Approach:- ObservingListening to the lecturer's explanation regarding the theory of light waves- AskingDiscussing solutions to problems- ExploringMaking observation reports regarding the theory of light waves-Associating Analyzing the results of observations- CommunicatingDiscussing the results of observations. 2 X 50			0%
13	Able to present and apply optoelectronic devicesLaser applications such as Laser Range FinderLight detecting and RangingSpectrophotometerCompact Disk, Digital Versatile Disk, Blu-Ray DiskHolographyLaser implementation in medical industry and military	1.Can present and apply optoelectronic devices, laser applications such as Laser Range Finder 2.Light detecting and Ranging 3.Spectrophotometer 4.Compact Disk, Digital Versatile Disk, Blu-Ray Disk 5.Holography 6.Laser implementation in industrial and military medicine		Model: Cooperative learningMethod: Discussion Scientific Approach:- ObservingListening to the lecturer's explanation regarding the theory of light waves- AskingDiscussing solutions to problems- ExploringMaking observation reports regarding the theory of light waves-Associating Analyzing the results of observations- CommunicatingDiscussing the results of observations. 2 X 50			0%
14	Able to present and apply optoelectronic devicesLaser applications such as Laser Range FinderLight detecting and RangingSpectrophotometerCompact Disk, Digital Versatile Disk, Blu-Ray DiskHolographyLaser implementation in medical industry and military	1.Can present and apply optoelectronic devices, laser applications such as Laser Range Finder 2.Light detecting and Ranging 3.Spectrophotometer 4.Compact Disk, Digital Versatile Disk, Blu-Ray Disk 5.Holography 6.Laser implementation in industrial and military medicine		Model: Cooperative learningMethod: Discussion Scientific Approach:- ObservingListening to the lecturer's explanation regarding the theory of light waves- AskingDiscussing solutions to problems- ExploringMaking observation reports regarding the theory of light waves-Associating Analyzing the results of observations- CommunicatingDiscussing the results of observations. 2 X 50			0%
15	Able to present and apply optoelectronic devicesLaser applications such as Laser Range FinderLight detecting and RangingSpectrophotometerCompact Disk, Digital Versatile Disk, Blu-Ray DiskHolographyLaser implementation in medical industry and military	1.Can present and apply optoelectronic devices, laser applications such as Laser Range Finder 2.Light detecting and Ranging 3.Spectrophotometer 4.Compact Disk, Digital Versatile Disk, Blu-Ray Disk 5.Holography 6.Laser implementation in industrial and military medicine		Model: Cooperative learningMethod: Discussion Scientific Approach:- ObservingListening to the lecturer's explanation regarding the theory of light waves- AskingDiscussing solutions to problems- ExploringMaking observation reports regarding the theory of light waves-Associating Analyzing the results of observations- CommunicatingDiscussing the results of observations. 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.