SEMESTER LEARNING ACTIVITY PLANS (SLAP)

SEMESTER EVEN 2022/2023

Physics Undergraduate Study Program

Physics Department

Basic Physics Experiments II

MFF 1014/ 1 Credits

Lecturer Coordinator:

Teaching Team of Basic Physics Laboratory

UNIVERSITAS GADJAH MADA
FACULTY OF MATHEMATICS AND NATURAL SCIENCE
2022

	Universitas Gadjah Mada Faculty of Mathematics and Natural Science Physics Department / Physics Undergraduate Study Program Semester EVEN 2022/2023	**Document Number :** ……

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Code	Course Name	Credits (Credits)		Semester	Status	Prerequisite
MFF 1014	*Basic Physics Experiments II*	*T: 1*	*P: …*	*EVEN*	*Compulsory*	*None*

Short Description	The Basic Physics Experiments II Course is a mandatory one-credit course in the 2021 Curriculum for the Undergraduate Physics Study Program, Faculty of Mathematics and Natural Sciences UGM. The general objective of holding this Constitutional Court is to provide mastery of knowledge related to material physics. The 2021 curriculum of the Courses Physics Study Program is associated with: With competence in aspects of Knowledge (PLO 2), aspects of general skills (PLO 3), aspects of special skills (PLO 4), and aspects of long-life learning/self-development (PLO 5). Learning is carried out based on a face-to-face schedule in the laboratory for six weeks, with each week's meeting held for 180 minutes. The steps are to carry out the theory of errors before starting the practicum. Then the practicum activities and the next are used for responses or final practicum assessments. Evaluation for students for course assessment is carried out summatively and formatively. Summatively, it is manifested in written form as pretests, practicum reports, and responses carried out in a series of practicums. The formative evaluation is realized through a practicum in groups and independent activities writing a practicum report. The monitoring process is carried out by looking at student activities during the practicum process, such as attendance in practicum, skills in mastering tools, understanding of the material being presented, and student performance in doing independent assignments in the form of practicum reports given.
Program Learning Outcomes (PLO) Imposed on the Course	***PLO 2***	Knowledge. Able to explain theoretical concepts and principles of classical and modern physics and able to apply basic concepts of physics and related mathematical methods in finding solutions to physical problems.
	PLO 4	Special Skills. Able to design and carry out experiments/theoretical reviews, able to identify a physical problem based on the results of observations and experiments, and able to operate related technologies.
	PLO 5	Long Life Learning. Able to analyze various alternative solutions to physical problems and conclude them for appropriate decision-making, both in familiar and new problems.
Course Outcomes (CO)	**After completing this course, students are expected to be able to:**	
	CO1	Students can explain concepts based on optical phenomena and relate them to the basic concepts [PLO 2 PLO 4 PLO 5].
	CO2	Students can explain the concepts of electrical phenomena and relate them to the basic concepts obtained. [PLO 2 PLO 4 PLO 5]
	CO3	Students can convey the results of their experiments in the form of a written report [PLO 3]
	CO4	Students can work either individually or in groups in carrying out experiments [PLO 3]

The Correlation of CO to Learning		Learning Materials	Learning Methods	Time Allocation
	CO 1, CO 2, CO 3, CO 4	Newton's ring, Measurement of electric power, Photometry,		***1X50 minutes***

Materials and Methods, and Time Allocation		Measurement of Refractive Index, Earth's Magnetic Field, Oscilloscope, Stefan's Law, Ohm's Law		
	CO 1, CO 2, CO 3, CO 4	Newton's Rings, Electrical power measurement, Photometry, Refractive Index Measurement, Earth's Magnetic Field, Oscilloscope, Stefan's Law, Ohm's Law		***1X50 minutes***
	CO 1, CO 2, CO 3, CO 4	Newton's ring, Measurement of electric power, Photometry, Measurement of Refractive Index, Earth's Magnetic Field, Oscilloscope, Stefan's Law, Ohm's Law		***1X50 minutes***
	CO 1, CO 2, CO 3, CO 4	Newton's Rings, Electrical power measurement, Photometry, Refractive Index Measurement, Earth's Magnetic Field, Oscilloscope, Stefan's Law, Ohm's Law		***1X50 minutes***
	CO 1, CO 2, CO 3, CO 4	Newton's ring, Measurement of electric power, Photometry, Measurement of Refractive Index, Earth's Magnetic Field, Oscilloscope, Stefan's Law, Ohm's Law		***1X50 minutes***
	CO 1, CO 2, CO 3, CO 4	Newton's ring, Measurement of electric power, Photometry, Measurement of Refractive Index, Earth's Magnetic Field, Oscilloscope, Stefan's Law, Ohm's Law		***1X50 minutes***
	CO 1, CO 2, CO 3, CO 4	Newton's Rings, Electrical power measurement, Photometry, Refractive Index Measurement, Earth's Magnetic Field, Oscilloscope, Stefan's Law, Ohm's Law		***1X50 minutes***
	Midterm exam/Project Task Results/Case Analysis Results			
	CO 1, CO 2, CO 3, CO 4	Newton's Rings, Electrical power measurement, Photometry, Refractive Index Measurement, Earth's Magnetic Field, Oscilloscope, Stefan's Law, Ohm's Law		***1X50 minutes***
	CO 1, CO 2, CO 3, CO 4	Newton's ring, Measurement of electric power, Photometry, Measurement of Refractive Index, Earth's Magnetic Field,		***1X50 minutes***

		Oscilloscope, Stefan's Law, Ohm's Law			
	CO 1, CO 2, CO 3, CO 4	Newton's Rings, Electrical power measurement, Photometry, Refractive Index Measurement, Earth's Magnetic Field, Oscilloscope, Stefan's Law, Ohm's Law			***1X50 minutes***
	CO 1, CO 2, CO 3, CO 4	Newton's ring, Measurement of electric power, Photometry, Measurement of Refractive Index, Earth's Magnetic Field, Oscilloscope, Stefan's Law, Ohm's Law			***1X50 minutes***
	CO 1, CO 2, CO 3, CO 4	Newton's ring, Measurement of electric power, Photometry, Measurement of Refractive Index, Earth's Magnetic Field, Oscilloscope, Stefan's Law, Ohm's Law			***1X50 minutes***
	CO 1, CO 2, CO 3, CO 4	Newton's Rings, Electrical power measurement, Photometry, Refractive Index Measurement, Earth's Magnetic Field, Oscilloscope, Stefan's Law, Ohm's Law			***1X50 minutes***
	CO 1, CO 2, CO 3, CO 4	Newton's Rings, Electrical power measurement, Photometry, Refractive Index Measurement, Earth's Magnetic Field, Oscilloscope, Stefan's Law, Ohm's Law			***1X50 minutes***
	Final exams/ Project Task Results/Case Analysis Results				
Learning Methods	**CBL (Case Based Learning): Pretest, Presentation of material and some display material, Hands-on experiments using available set-ups, Making reports**				
Student Learning Experience	**Learn to study and examine practical work in optics and electricity, including Newton's rings, electric power measurements, photometry, refractive index measurements, the earth's magnetic field, oscilloscopes, Stefan's law, and Ohm's law.**				
Access to Learning Media/ LMS and Offline and Online Percentage	Offline (Experimental tool) and Online (Zoom Meeting, Google Meet, Google Classroom)				

Assessment Methods and Synchronization with CO	**Assessment Methods**	**Assessment Percentage**	**Criteria/ Indicators**	**CO1**	**CO2**	**CO3**	**CO4**
	Participatory Activity*						

	Project Results/ Case Study Results/ PBL Results*						
	Cognitive						
	Pretest	**10**		√	√	√	
	Practicum	**20**					
	Practicum Report	**40**		√	√	√	√
	Final Test	**30**		√	√	√	√
	Total	**100**					
	*) can also be obtained from the Midterm or Final Exam as the result of participatory activities or project/ case study results. According to IKU 7, the percentage of project results/ case study/ PBL results is at least 50%.						

References	**Main References;** 1. Buku Panduan Praktikum Fisika Dasar II. 2. Wilson, J.D.,& Hernandez, C.A.,2014, Physics Laboratory Experiments, 7th ed, BROOKS/COLE Cengage Learning, USA. 3. Kraftmakher, Y., 2015, Experiments and Demonstrations in Physics, 2nd ed., World Scientific Publishing Co. Pte. Ltd.
Lecturers (*Team Teaching*)	1. Tim Laboratorium Fisika Dasar

Authorization	**Date of Drafting**	**Lecturer Coordinator**	**Head of Curriculum Committee**	**Head of Study Program**
		Tim Laboratorium Fisika Dasar		*Dr. Eng. Ahmad Kusumaatmaja, S.Si., M.Sc.*