

**SEMESTER LEARNING ACTIVITY PLANS
(SLAP)
SEMESTER ODD/EVEN 2022/2023**



Physics Undergraduate Study Program
Physics Department
Solids State Physics Experiments**)
MFF 3602/ 1 Credits

Lecturer Coordinator:

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**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
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Code	Course Name	Credits (Credits)		Semester	Status	Prerequisite
<i>MFF 3602</i>	<i>Solid State Physics Experiments**)</i>	<i>T: 1</i>	<i>P: ...</i>	<i>ODD/EVEN</i>	<i>Compulsory</i>	<i>Solid State Physics I (MFF2601)</i>
Short Description	<p>The Solid State Physics Experiments is designed to deepen students' understanding of the physical phenomena that occur in several kinds of solid materials and their technological applications, such as semiconductor materials, magnets, and dielectrics. In this practicum, students will also directly observe the properties of these materials through the experiments carried out, record and validate the experimental data obtained, and analyze them to conclude.</p> <p>Through this practicum, it is hoped that students will be able to explain related physical phenomena, how these phenomena are translated into technical experiments and data collection, analyze the data appropriately obtained, and report it in writing and orally. In this practicum, students are also expected to be able to work in teams in carrying out practicums and reporting verbally through responsiveness.</p>					
Program Learning Outcomes (PLO) Imposed on the Course	<i>PLO 2</i>	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.				
	<i>PLO 5</i>	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:					
	<i>CO1</i>	Students can explain the concepts underlying physical phenomena in solid materials and their applications in related technologies.				
	<i>CO2</i>	Students can explain the experimental design to observe a physical phenomenon and relate it to the basic concept.				
	<i>CO3</i>	Students can carry out experiments on a phenomenon in solid materials and analyze their experiments' results.				
	<i>CO4</i>	Students can convey the results of their experiments both in the form of written and oral communication.				
	<i>CO5</i>	Students can work individually and in groups in experiments and present the results obtained.				
The Correlation of CO to Learning Materials and Methods, and Time Allocation			Learning Materials	Learning Methods	Time Allocation	
	<i>CO 1, CO 2, CO 3, CO 4, CO 5</i>		Determination of the Diffusion Rate of Salt Molecules by Laser Deflection Measurement	CBL	<i>1X50 minutes</i>	
	<i>CO 1, CO 2, CO 3, CO 4, CO 5</i>		Power Diode/LED Gap Measurement	CBL	<i>1X50 minutes</i>	

	<i>CO 1, CO 2, CO 3, CO 4, CO 5</i>	The response I : Practical Topic in Weeks 1 - 2		CBL				<i>5X50 minutes</i>	
Midterm exam/Project Task Results/Case Analysis Results									
	<i>CO 1, CO 2, CO 3, CO 4, CO 5</i>	Hall Assignment Measurement and Load Carrier Meeting		CBL				<i>1X50 minutes</i>	
	<i>CO 1, CO 2, CO 3, CO 4, CO 5</i>	Measurement of Magnetic Susceptibility with the Gouy Method		CBL				<i>1X50 minutes</i>	
	<i>CO 1, CO 2, CO 3, CO 4, CO 5</i>	2. Alpha Spectroscopy Experiment, detecting alpha particles that decay from radioactive sources using a Solid State (NaI Tl) detector.		CBL				<i>1X50 minutes</i>	
	<i>CO 1, CO 2, CO 3, CO 4, CO 5</i>	Test Current-Voltage Characteristics of Silicon Solar Cells		CBL				<i>1X50 minutes</i>	
	<i>CO 1, CO 2, CO 3, CO 4, CO 5</i>	Response II Practicum Topics in Weeks 4-6		CBL				<i>3X50 minutes</i>	
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	Conducting experiments, discussing, analyzing data, and making written reports.								
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	CO5	
	Participatory Activity*								
	Project Results/ Case Study Results/ PBL Results*								
	Cognitive								
	Pretest	10		√	√				
	Practicum	30				√		√	
	Practicum Report	25				√	√		
	Final Test	35		√	√		√	√	
	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 Zat Padat.			
Lecturers (Team Teaching)	1. Dr. Chotimah 2. Devy Pramudyah Wardani, M.Sc.			
Authorization	Date of Drafting	Lecturer Coordinator	Head of Curriculum Committee	Head of Study Program
		<i>Dr. Chotimah</i>		<i>Dr. Eng. Ahmad Kusumaatmaja, S.Si., M.Sc.</i>