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

Physics of Electronics Material

MFF5710 / 3 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 / Study Program Master Physics
Semester Even 2022/2023

SEMESTER LEARNING ACTIVITY PLANS (SLAP)

Code	Course Name	Credits (credits)	Semester	Status	Prerequisite
MFF5710	*Physics of Electronics Material*	*3*	*Even*	*Elective*	*None*

Short Description

Physics of Electronics Material course is Elective course 3 credits (Theory) in the 2022 Curriculum Master Physics Study Program, Faculty of Mathematics and Natural Science UGM.

The syllabus of this course is as follows:
Electron wave properties, Schrodinger equations, Schrodinger game solving, Energy Band theory in crystals, electrons inside crystals, Electron conductivity inside metals and alloys, semiconductors, Electron conductivity inside ceramics and material amorphous, optical properties in atomic theory, Quantum mechanics treatment for optical properties, fundamental thermal properties, thermal conductivity, heat capacity, thermal expansion.

The courses are held in class for 14 weeks, each week's session last for 3 x 50 minutes. Four weeks of course period is used for Midterm Exam and Final Exam, each held for two weeks as scheduled.

Student evaluation for course assessments is performed summative and formative. The summative evaluation is implemented as written exams, both Midterm and Final Exam, which take a maximum of 120 minutes. The formative evaluation is implemented as individual assignments for each student in the form of completing an assignment individually. Monitoring is carried out by observing student activities during the course, such as attendance, Q&A and discussion about the material presented, and student performance in completing individual assignments.

Program Learning Outcomes (PLO) Imposed on the Course

PLO 3	Mastering further knowledge of classical and modern physics theory, and its relationship with other disciplines, and has mastered an advanced field of physics specialization that allows him to keep up with the latest international research developments.
PLO 5	Able to plan, manage and carry out experiments and conclude the results, or be able to create and use modeling and simulations based on the basic principles of physics to study and solve a problem in a scientific field of Physics or applied Physics that produces models, methods, or theories tested and innovative.
PLO 6	Able to apply knowledge to analyze, synthesize, formulate problems and solve problems comprehensively in one of advanced field of physics, through experimental or theoretical research, then be able to classify and draw conclusions about their findings for the development of science and technology.

Upon completion of this course, students should be able to:

Course Outcomes (CO)	***CO1***	Understand the electronic properties of materials (both semiconductor and amorphous) is based on analytical skills based on the fundamental concepts of electron characteristics in solids, including transport, thermal, and optical characteristics.		
	CO2	Solve problems with structured solutions (well-defined solutions) in electronic material systems.		
	CO3			
	CO4			
	CO5			
	CO6			
	CO7			
	CO8			
The Correlation of CO to Learning Materials and Methods, and Time Allocation		**Learning Materials**	**Learning Methods**	**Time Allocation**
	CO1			3 x 50 minutes
	CO1			3 x 50 minutes
	CO1			3 x 50 minutes
	CO2			3 x 50 minutes
	CO2			3 x 50 minutes
	CO2			3 x 50 minutes
	CO2			3 x 50 minutes
	CO3			3 x 50 minutes
	CO3			3 x 50 minutes
	CO3			3 x 50 minutes
	CO4			3 x 50 minutes
	CO4			3 x 50 minutes
	CO4			3 x 50 minutes
	CO4			3 x 50 minutes
	Final Exam/ Project Task Results/ Case Analysis Results			
Learning Methods				
Student Learning Experience	Learn to analyze and review: , , , , , , , , , , , , , , .			

Access to Learning Media/ LMS and Offline and Online Percentage	
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						
Assignment	30%		7,5%	7,5%	7,5%	7,5%
Quiz						
Midterm Exam	35%		17,5%	17,5%		
Final Exam	35%				17,5%	17,5%

*) 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:** Hummel, Rolf E. 1985, Electronic Properties of Materials (An Introduction for Engineers).
Lecturers (*Team Teaching*)	1. Moh. Adhib Ulil Absor, S.Si., M.Sc., Ph.D. 2. Dr.Sc. Ari Dwi Nugraheni, S.Si., M.Si. 3. 4.

Authorization	**Date of Drafting**	**Lecturer Coordinator**	**Head of Curriculum Committee**	**Head of Study Program**
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