SEMESTER LEARNING ACTIVITY PLANS (SLAP)

SEMESTER EVEN 2022/2023

Physics Undergraduate Study Program

Physics Department

Selected Topics in Material Physics

MFF 3810/ 2 Credits

Lecturer Coordinator:

Prof. Dr. Yusril Yusuf
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UNIVERSITAS GADJAH MADA
FACULTY OF MATHEMATICS AND NATURAL SCIENCE

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Code	Course Name	Credits (Credits)		Semester	Status	Prerequisite
MFF 3810	*Selected Topics in Material Physics*	*T: 2*	*P: …*	*EVEN*	*Elective*	*Solid State Physics I (MFF 2601)*

Short Description	The Selected Topics in material physics course is an elective course of 2 Credits in the 2021 Curriculum for the Undergraduate Physics Study Program, Faculty of Mathematics and Natural Sciences UGM. The general purpose of organizing these courses is to provide mastery of knowledge related to material physics. In the 2021 curriculum for the Physics Study Program, these courses are associated with competencies in the Knowledge aspect (PLO 2) and the long-life learning/self-development aspect (PLO 5). Learning is carried out based on a face-to-face schedule in class for 14 weeks, with meetings held for 300 minutes each week, interspersed with group assignment presentations. Four weeks during the lecture period are used for Mid-Semester Examinations and Final Semester Examinations, each of which is held on a scheduled basis for two weeks by the Academic Section of FMIPA UGM. Evaluation for students for course assessment is carried out in a summative and formative manner. Summatively it is realized in the form of a written exam, both the Mid-Semester Examination and the Final Semester Examination, which takes a maximum of 120 minutes. The formative evaluation is realized through independent assignments for each student and group. The form of independent activity is in the form of completing an assignment/homework given to students to be completed independently at home and by giving presentation assignments. The monitoring process is carried out by observing student activities during the lecture process, such as attendance in lectures, questions and answers, discussions on the material being presented, and student performance in doing independent assignments in the form of homework 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 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 about Biomaterials and Liquid Crystals
	CO2	Students can explain the fabrication and characterization of metamaterials.
	CO3	Students can explain about protein physics and its characterization
	CO4	Students can explain polymers and their applications in physics.

The Correlation of CO to Learning Materials and Methods, and Time Allocation		**Learning Materials**	**Learning Methods**	**Time Allocation**
	CO 1	Biomaterial Physics	TCL-SCL mixed	***2X50 minutes***
	CO 1	Biomaterials and Bioplastics	TCL-SCL mixed	***2X50 minutes***
	CO 1	Research in Liquid Crystals	TCL-SCL mixed	***2X50 minutes***
	CO 2	Introduction to Metamaterial	TCL-SCL mixed	***2X50 minutes***
	CO 2	Metamaterial Fabrication	TCL-SCL mixed	***2X50 minutes***

	CO 2	Characterization of Metamaterials	TCL-SCL mixed	***2X50 minutes***
	CO 3	Protein Physics	TCL-SCL mixed	***2X50 minutes***
	Midterm exam/Project Task Results/Case Analysis Results			
	CO 3	Characterization in protein physics	TCL-SCL mixed	***4X50 minutes***
	CO 4	polymer introduction	TCL-SCL mixed	***4X50 minutes***
	CO 4	Polymer applications in materials physics	TCL-SCL mixed	***6X50 minutes***
	Final exams/ Project Task Results/Case Analysis Results			

Learning Methods	**SCL (Student Centered Learning): Project-based learning (Team-based Project)/Case-based learning/PBL/other SCL methods**
Student Learning Experience	**Learn to study and study: protein physics, characterization in protein physics, introduction to polymers, application of polymers in material physics.**
Access to Learning Media/ LMS and Offline and Online Percentage	Offline (LCD, PPT Slide, Whiteboard, Laptop) 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						
Midterm Exam	**50**		√	√	√	
Final Exam	**50**				√	√
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. Related international journals (accessed from http://lib.ugm.ac.id, as well as international journal sources other).

Lecturers (*Team Teaching*)

1. Prof. Dr. Yusril Yusuf
2. Dr. Juliasih Partini

	3. Dr. Ari Dwi Nugraheni 4. Dr. Ahmad Kusumaatmaja			
Authorization	**Date of Drafting**	**Lecturer Coordinator**	**Head of Curriculum Committee**	**Head of Study Program**
		Prof. Dr. Yusril Yusuf		*Dr. Eng. Ahmad Kusumaatmaja, S.Si., M.Sc.*