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

Physics Undergraduate Study Program

Physics Department

Radiographic Physics

MFF 38776/ 2 Credits

Lecturer Coordinator:

Drs. Gede Bayu Suparta, M.S., Ph.D.

UNIVERSITAS GADJAH MADA
FACULTY OF MATHEMATICS AND NATURAL SCIENCE
2022

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	Faculty of Mathematics and Natural Science Physics Department / Physics Undergraduate Study Program Semester EVEN 2022/2023		…………		

SEMESTER LEARNING ACTIVITY PLANS (SLAP)						
Code	**Course Name**	**Credits (Credits)**		**Semester**	**Status**	**Prerequisite**
MFF 38776	*Radiographic Physics*	*T: 2*	*P: ...*	*EVEN*	*Elective*	*None*

Short Description	The Radiography Physics course is a 2 Credits elective course in the 2021 curriculum for the Bachelor of Physics at Gadjah Mada University, which can be taken in the Even semester. To be able to take this course, students are recommended to have completed the Image Physics course. In the 2021 Curriculum of the Physics Study Program, this course is associated with competencies in the Knowledge Aspect (PLO 2) and the Long Life Learning/Self-Development Aspect (PLO 5).

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	Know and understand the history of radiography and the application of radiography in the industrial, medical, and laboratory fields
	CO2	Know and understand the fundamental theories in Radiography Physics
	CO3	Know and understand how the radiographic system
	CO4	Knowledge and understanding of digital radiography
	CO5	Knowing and understanding the application of Radiography

The Correlation of CO to Learning Materials and Methods, and Time Allocation		**Learning Materials**	**Learning Methods**	**Time Allocation**
	CO 1	History of Radiography, Applications of radiography (laboratory, medical and industrial)	TCL-SCL mixed	*2X50 minutes*
	CO 2	Basic Theory: Atoms and Atomic Structure	TCL-SCL mixed	*2X50 minutes*
	CO 2	Basic Theory: Electricity and Magnetism	TCL-SCL mixed	*2X50 minutes*
	CO 2	Basic Theory: Electromagnetic radiation and the interaction of radiation with matter	TCL-SCL mixed	*2X50 minutes*
	CO 3	Radiographic System: X-ray/gamma generator	TCL-SCL mixed	*2X50 minutes*
	CO 3	Radiography System: Detector and detection system	TCL-SCL mixed	*2X50 minutes*
	CO 3	Fluorescent radiography and film radiography	TCL-SCL mixed	*2X50 minutes*
	Midterm exam/Project Task Results/Case Analysis Results			

	CO 4	Digital radiography: Digital images and digital scanners	TCL-SCL mixed	*2X50 minutes*
	CO 4	Digital radiography: Image capture and computer radiography	TCL-SCL mixed	*2X50 minutes*
	CO 4	Digital radiography: Live digital radiography	TCL-SCL mixed	*2X50 minutes*
	CO 4	Digital radiography: Teleradiology	TCL-SCL mixed	*2X50 minutes*
	CO 5	Radiographic Applications: NDT	TCL-SCL mixed	*2X50 minutes*
	CO 5	Radiographic applications: Inspection of goods, Inspection of micro materials/objects	TCL-SCL mixed	*2X50 minutes*
	CO 5	radiology (medical)	TCL-SCL mixed	*2X50 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	**Listen, ask, answer questions and discuss**
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**	**CO5**
	Participatory Activity*							
	Project Results/ Case Study Results/ PBL Results*							
	Cognitive							
	Assignment	10		√	√	√	√	√
	Quiz	10		√	√	√	√	√
	Midterm Exam	40		√	√	√		
	Final Exam	40					√	√
	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. Buzug, T.M., 2008. Computed Tomography: From Photon Statistics to Modern Cone-Beam CT, SpringerVerlag Berlin Heidelberg.. 2. National Academic of Science, 1996, Mathematics and Physics of Emerging Biomedical Imaging, National Academic Press, Washington, Ch. 1-6.	
Lecturers (*Team Teaching*)	1. Drs. Gede Bayu Suparta, M.S., Ph.D.	

Authorization	**Date of Drafting**	**Lecturer Coordinator**	**Head of Curriculum Committee**	**Head of Study Program**
		Drs. Gede Bayu Suparta, M.S., Ph.D.		*Dr. Eng. Ahmad Kusumaatmaja, S.Si., M.Sc.*