SEMESTER LEARNING ACTIVITY PLANS (SLAP)

SEMESTER ODD 2022/2023

Physics Undergraduate Study Program

Physics Department

Sensor System

MFF 2853/ 2 Credits

Lecturer Coordinator:

Prof. Dr. Eng. Kuwat Triyana, M.Si
Dr.Eng. Edi Suharyadi, S.Si., M.Eng.

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 ODD 2022/2023	**Document Number :** ……

SEMESTER LEARNING ACTIVITY PLANS (SLAP)

Code	Course Name	Credits (Credits)		Semester	Status	Prerequisite
MFF 2853	*Sensor System*	*T: 2*	*P: …*	*ODD*	*Elective*	*Electronics (MFF 1850)*

Short Description	The Sensor System course is an elective course of 2 credits in the 2021 curriculum for the Bachelor of Physics at Gadjah Mada University, which can be taken in Odd semesters. To be able to take this course, students are recommended to have completed the Electronics course. In the 2021 Curriculum of the Physics Undergraduate 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	Knowing and Understanding the Basics of Sensors and their applications
	CO2	Know and understand sensor systems and signal conditioning
	CO3	Know and understand the types of sensors

The Correlation of CO to Learning Materials and Methods, and Time Allocation		**Learning Materials**	**Learning Methods**	**Time Allocation**
	CO 1	Sensor basics and their application		***2X50 minutes***
	CO 2	Sensor System		***2X50 minutes***
	CO 2	Signal Conditioning		***2X50 minutes***
	CO 3	Acceleration and Vibration Sensor		***2X50 minutes***
	CO 3	Chemical sensors and biosensors		***2X50 minutes***
	CO 3	Inductive and capacitive-based displacement sensors		***2X50 minutes***
	CO 3	Electromagnetism Sensor		***2X50 minutes***
	Midterm exam/Project Task Results/Case Analysis Results			
	CO 3	Flow and level sensor		***2X50 minutes***
	CO 3	Force and weight sensors		***2X50 minutes***
	CO 3	Temperature and humidity sensors		***2X50 minutes***
	CO 3	Optical sensor		***2X50 minutes***
	CO 3	Position sensor		***2X50 minutes***
	CO 3	Pressure sensor		***2X50 minutes***
	CO 3	Strain sensor		***2X50 minutes***
	Final exams/ Project Task Results/Case Analysis Results			

<table>
<tr><td>Learning Methods</td><td colspan="6">SCL (Student Centered Learning): Project-based learning (Team-based Project)/Case-based learning/PBL/other SCL methods</td></tr>
<tr><td>Student Learning Experience</td><td colspan="6">Listen, ask, answer questions and discuss</td></tr>
<tr><td>Access to Learning Media/ LMS and Offline and Online Percentage</td><td colspan="6">Offline (LCD, PPT Slide, Whiteboard, Laptop) and Online (Zoom Meeting, Google Meet, Google Classroom)</td></tr>
<tr><td rowspan="10">Assessment Methods and Synchronization with CO</td><td>Assessment Methods</td><td>Assessment Percentage</td><td>Criteria/ Indicators</td><td>CO1</td><td>CO2</td><td>CO3</td></tr>
<tr><td>Participatory Activity*</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Project Results/ Case Study Results/ PBL Results*</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td colspan="6">Cognitive</td></tr>
<tr><td>Assignment</td><td>20</td><td></td><td>√</td><td>√</td><td>√</td></tr>
<tr><td>Midterm Exam</td><td>40</td><td></td><td>√</td><td>√</td><td></td></tr>
<tr><td>Final Exam</td><td>40</td><td></td><td></td><td></td><td>√</td></tr>
<tr><td>Total</td><td>100</td><td></td><td></td><td></td><td></td></tr>
<tr><td colspan="6">*) 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%.</td></tr>
<tr><td>References</td><td colspan="6">Main References;
1. Alan S. Morris, 2001, Measurement and Instrumentation Principles, Butterworth-Heinemann, Oxford .
2. Hebra, A.J., 2010, The Physics of Metrology, Springer-Verlag, Morlenbach, Germany.
3. Wilson, J.S., 2005, Sensor Technology Handbok, Elsevier Inc., Burlington, USA.</td></tr>
<tr><td>Lecturers (Team Teaching)</td><td colspan="6">1. Prof. Dr. Eng. Kuwat Triyana, M.Si
2. Dr.Eng. Edi Suharyadi, S.Si., M.Eng.</td></tr>
<tr><td rowspan="2">Authorization</td><td>Date of Drafting</td><td colspan="2">Lecturer Coordinator</td><td>Head of Curriculum Committee</td><td colspan="2">Head of Study Program</td></tr>
<tr><td></td><td colspan="2">Prof. Dr. Eng. Kuwat Triyana, M.Si</td><td></td><td colspan="2">Dr. Eng. Ahmad Kusumaatmaja, S.Si., M.Sc.</td></tr>
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