SEMESTER LEARNING ACTIVITY PLANS (SLAP)

SEMESTER EVEN 2022/2023

Physics Undergraduate Study Program

Physics Department

Electronics

MFF 1850/ 3 Credits

Lecturer Coordinator:

Dr. Eng. Ahmad Kusumaatmja, S.Si., M.Sc.

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

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Code	Course Name	Credits (Credits)		Semester	Status	Prerequisite
MFF 1850	*Electronics*	*T: 3*	*P: …*	*EVEN*	*Compulsory*	*None*

Short Description	The Electronics course is a compulsory subject in the Physics Study Program of the Department of Physics, FMIPA UGM. In the 2021 curriculum, the Electronics course is given to students in semester 2. In the Physics Study Program, the Electronics course focuses on understanding the basic principles of electronics and their applications. The main points of discussion at the first-week meeting s.d. nine deal with the basics of analog electronics and an introduction to digital electronics. The basics of digital electronics are the subject of the 10th to 10th-week meeting. 14. The learning method is a combination of teaching-based and case-based learning. Student grades are a combination of quiz scores, individual and group assignments/exercises, and midterm and final semester exams.	
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 apply the fundamental laws of circuits and their analysis methods to direct current (DC) electric circuits.
	CO2	Students can analyze the use of capacitors and inductors.
	CO3	Students can analyze the use of diodes and transistors.
	CO4	Students can use operational amplifiers according to their characteristics and functions.
	CO5	Students can apply the concept of digits, number systems (codes), and converters.
	CO6	Students can apply digital electronics concepts to operational amplifiers and logic gates (truth tables).
	CO7	Students can understand various combinations of logic.

The Correlation of CO to Learning Materials and Methods, and Time Allocation		**Learning Materials**	**Learning Methods**	**Time Allocation**
	CO 1	Basic Concepts	TCL-SCL mixed	***3X50 minutes***
	CO 1	Basic Laws	TCL-SCL mixed	***3X50 minutes***
	CO 2	Circuit Analysis Methods and circuit simulation software	TCL-SCL mixed	***3X50 minutes***
	CO 2	Theorem on circuits	TCL-SCL mixed	***3X50 minutes***
	CO 3	Diodes and Transistors	TCL-SCL mixed	***3X50 minutes***
	CO 3	O.P. Amps	TCL-SCL mixed	***3X50 minutes***
	CO 4	RLC circuit	TCL-SCL mixed	***3X50 minutes***
	Midterm exam/Project Task Results/Case Analysis Results			

	CO 4	AC circuit Circuit Analysis Method on AC Current	TCL-SCL mixed	***6X50 minutes***
	CO 5	Digital Electronics Number System	TCL-SCL mixed	***6X50 minutes***
	CO 6	Multivibrator Basic logic gate circuit	TCL-SCL mixed	***3X50 minutes***
	CO 7	Flip-flop Counter multiplexer PLD (Programmable Logic Devices)	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 examine and examine each topic that is taught.**
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	CO 1	CO 2	CO 3	CO 4	CO 5	CO 6	CO 7
Participatory Activity*	**10**		√			√	√	√	
Project Results/ Case Study Results/ PBL Results*	**30**		√			√		√	√
Cognitive									
Assignment	**5**			√	√		√		
Quiz	**5**		√			√		√	
Midterm Exam	**25**		√	√	√	√			
Final Exam	**25**					√	√	√	√
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. Horowitz, Paul, and Winfield Hill. 2015. The Art of Electronics. 3rd ed. Cambridge, TAS, Australia: Cambridge University Press..
2. Sadiku, M.N.O., dan Alexander, C.K., 2016, Fundamentals of Electric Circuits, 5th edition, The McGrawHill Companies, Inc..
3. Wang, M., 2010, Understandable Electric Circuits, The Institution of Engineering and Technology, London, United Kingdom..
4. Tokheim, R.L., 1995, Elektronika Digital, edisi kedua, Erlangga, Jakarta..

Lecturers (*Team Teaching*)	1. Dr. Eng. Ahmad Kusumaatmja, S.Si., M.Sc.			
Authorization	**Date of Drafting**	**Lecturer Coordinator**	**Head of Curriculum Committee**	**Head of Study Program**
		Dr. Eng. Ahmad Kusumaatmja, S.Si., M.Sc.		*Dr. Eng. Ahmad Kusumaatmaja, S.Si., M.Sc.*