UNIVERSITAS PENDIDIKAN INDONESIA
FACULTY OF MATHEMATICS AND NATURAL SCIENCES EDUCATION
DEPARTMENT OF PHYSICS EDUCATION
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Bachelor of Physics **MODULE HANDBOOK**

Module name:	Analog Electronics	
Module level, if applicable:	Undergraduate	
Code:	FI241	
Sub-heading, if applicable:	-	
Classes, if applicable:	-	
Semester:	3rd	
Module coordinator:	Ahmad Aminudin	
Lecturer(s):	Ahmad Aminudin	
Language:	Bahasa Indonesia	
Classification within the curriculum:	Compulsory course	
Type of Teaching:	Contact hours per week during the semester	Class Size
1. Lecture (conceptual, contextual and problem-solving approaches through expository, discussions and practical methods). 2. Structured activities (assignments based on conceptual, contextual and problem-solving approaches) 3. Self-study (reading literature and experiment project electronic circuit)	2 hour 30 minutes	45
Workload:	The total workload is 136 hours/8160 minutes (4.8 ECTS) per semester, consisting of 35 hours/2100 minutes lectures (1.24 ECTS), 42 hours/2520 minutes structured activities (1.48 ECTS) and 42 hours/2520 minutes self-study (1.71 ECTS) per week for 14 weeks, 17 hours/1020 minutes for two exams (0.6 ECTS).	
Credit points:	4,8 ECTS	
Pre-requisites course(s):	Basic Physics 1, Basic Physics 2	

<table>
<tr><td>Course Learning outcomes:</td><td>After taking this course the students have ability to:
CLO1. Describe the role of electronics in the industrialization era,
CLO2. Describe the principles of analog and digital signal representation,
CLO3. Analyze the behavior of semiconductor materials), currents in semiconductors, currents and capacitance of PN junctions,
CLO4. Describe the principles of ideal diodes, PN junctions, Reverse and Zener models
CLO5. Apply diode circuits for rectification, limiting and clamping,
CLO6. Characterize current-voltage, direct current circuit, basic amplifier,
CLO7. Analyze small signal model, small signal amplifier analysis,
CLO8. Describe the Biased Circuits, Transistor Discrete Amplifiers,
CLO9. Describe Thyristor concept: PNPN, DIAC TRIAC and SCS basic devices,
CLO10. Analyze the structure and workings of the device, the characteristics of the voltage current, the direct current circuit of the MOSFET,
CLO11. Utilize the MOSFET: Basic power amplifier, small signal model, small signal amplifier analysis, bias circuit and MOSFET amplifier,
CLO12. Apply Operational Amplifiers: inverting and non-inverting, differentiators, integrators, and detectors,
CLO13. Describe the oscillators and filters.</td></tr>
<tr><td>Content:</td><td>This course is a core expertise course of the Study Program. In this course, students will study Introduction, signal representation, Semiconductors: the behavior of semiconductor materials, currents in semiconductors, currents and capacitance of PN junctions; Diodes: ideal, PN junctions, Reverse and Zener models, rectifier circuits, limiting and clamping; Transistor: Current-voltage characteristic, Direct current circuit, Basic amplifier, small signal model, small signal amplifier analysis, Bias circuit, Transistor discrete amplifier. Thyristor: PNPN, DIAC TRIAC and SCS basic devices. MOSFET: device structure and operation, characteristics of current voltage, direct current circuit, Basic power amplifier, small signal model, analysis of small signal amplifiers, bias and amplifier circuits. Operational Amplifiers: Inverting and non-inverting, differentiator, integrator and Detectors, Operational Amplifiers (Op-Amp), Oscillators and Filters.</td></tr>
<tr><td>Study/exam achievements:</td><td>The final mark will be weight as follow:
<table>
<tr><th>No</th><th>CLO</th><th>Assessment Object</th><th>Assessment Techniques</th><th>Weight</th></tr>
<tr><td>1</td><td>CLO1 – CLO13</td><td>Subject specific competences:
a. Individual assignments
b. Exam
- Mid exam
- Final exam</td><td>

Written

Written Test
Written Test</td><td>

20 %

25%
25%</td></tr>
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	2	CLO5, CLO6, CLO11	Subject specific competences: a. Class Activity b. Experiment	 Performance Performance	 10% 20%
	Total				100%
Forms of media:	Board, LCD Projector, Laptop/Computer, LMS				
Literature:	1. A. S. Sedra and K.C. Smith: *Microelectronic Circuits,6th Edition*, Oxford University Press, 2010 2. T. Floyd: *Electronic Devices Conventional Current Version 9th edition,* Pearson, 2012				

PLO and CLO mapping

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10	PLO11	PLO12
CLO1		√										
CLO2		√										
CLO3		√										
CLO4		√										
CLO5		√										
CLO6		√										
CLO7		√										
CLO8		√										
CLO9		√										
CLO10		√										
COL11		√										
CLO12		√										
CLO13		√										